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PRODUCTIVE SECOND USES OF MINED LAND CONFERENCE

ECIAL PUBLICATION 85

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FRONT COVER PHOTOS (Clockwise from upper left)

Recreation Photo — Holme Pierrepont National Sports Center, England - wind surfing. Photo submitted by Holme Pierrepont National Sports Center

Farming Photo — Bush Farm Experiment, England - grain farming. Photo submitted by Dr. Stuart McRae

Development Photo — Larkspur Landing, Marin County, California, Photo by Norman T. Gilroy and Associates

Tourism Photo — Thorpe Park, England - Theme Park, Photo submitted by Dr. Stuart McRae

Art Photo — Photo from Earthworks: Land Reclamation as sculpture, Seattle Art Museum

BACK COVER PHOTOS (Clockwise from upper right)

Conferencing - Mined Land Reclamation Conference, Director Blubaugh, Photo by The Institute for Human Environment

Death Valley National Monument, the Bonnie Mine, example of desert masking/veneering, Photo by Zoe Mankoski, Mines and Geology

Teichert Headquarters on former sand and gravel operation site, Sacramento, California, Photo by Ken Cole, Mines and Geology

Horticultural Show - Hamm, West Germany, Photo by The Institute for the Human Environment

Modeling Scheme, Santa Cruz Valley, Arizona, Photo from publication "A Balanced Approach to Resource Extraction and Creative Land Development", University of Arizona.

DIVISION OF MINES AND GEOLOGY
JAMES F. DAVIS
STATE GEOLOGIST

SPECIAL PUBLICATION 85

PROCEEDINGS OF PRODUCTIVE SECOND USES OF MINED LAND CONFERENCE

SEPTEMBER 18-21, 1984
ASILOMAR CONFERENCE CENTER
PACIFIC GROVE, CALIFORNIA

JOINTLY SPONSORED BY:
CALIFORNIA DEPARTMENT OF CONSERVATION
DIVISION OF MINES AND GEOLOGY
AND
THE INSTITUTE FOR THE HUMAN ENVIRONMENT

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1416 Ninth St., Rm. 1341
Sacramento, CA 95814

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Introduction

Introduction

The reclamation of surface mined lands in the United States began in the midwest in the 1920's as a voluntary experimental program initiated by coal companies. This demonstration work provided impetus for the first State mined-land reclamation laws. Most new programs initiated in the 1970's treat mining as an interim land use and this concept is being expressed increasingly in planning for mining and reclamation.

Land use decisions in our society today are more complex than ever before. Wise mineral resource management, mitigation of environmental impacts, and consideration of current and future land use alternatives are all integral parts of the reclamation planning process. It is with this in mind that in the summer of 1983, the California Department of Conservation, through its Division of Mines and Geology, and The Institute for the Human Environment, a San Francisco based public service organization, began discussing the idea of a conference on the topic of mined land reclamation.

The two organizations agreed to jointly sponsor a conference that would promote advances in the practice of mined land reclamation planning by focusing on opportunities for second uses of mined lands. Experts from the fields of mined land reclamation and land use planning, mining, economics, marketing, government, and conservation were invited to participate in an exchange of information about second use planning in mined land reclamation. The idea was to provide a workshop setting designed to maximize discussion between participants. In such a setting, participants could identify common interests, improve their understanding of each other's roles and perspectives, and exchange information and specific examples of successful mined land reclamation and second use planning.

The State of California's interest in the topic of mined land reclamation is based primarily on the Surface Mining and Reclamation Act (SMARA), passed by the Legislature in 1975 and amended in 1980. SMARA provides for a cooperative approach to reclamation planning in California involving cities and counties (SMARA's lead agencies with regulatory responsibility), the mineral industry, and the Department of Conservation. The Department of Conservation is vitally concerned with supporting the vigor of California's mineral

industry while also providing for the responsible reclamation of mined lands in the State.

The Institute for the Human Environment focuses its efforts on promoting an exchange of knowledge on emerging issues that affect the quality of life of people in urbanizing communities. Almost every urban or rural area is affected by mining of some kind. The conference was, therefore, seen by the Institute as a timely activity, capable of advancing the state-of-the-art of an important issue at a time when widespread attention is being given to new legislation, regulation, and research on the topic of mining and reclamation in the United States and abroad.

The conference was held at the Asilomar Conference Center near Monterey, California. Over 130 talented and well-informed experts working in a wide variety of disciplines participated. Of these, there were 20 representatives of local agencies in California (from San Diego in the south to Trinity County in the north), 24 representatives of State governments, and 11 representatives of Federal agencies, including the Bureau of Land Management and the U.S. Forest Service. Also in attendance were 35 representatives of the mining industry and mining associations nationwide, 10 representatives of the land-use development field, 5 representatives of conservation and special interest groups, 21 consultants and suppliers, and a sprinkling of students and educators interested in mining, reclamation, and land use.

Eight co-sponsors from industry, government, and the mining associations provided additional financial and logistical support. They included the National Crushed Stone Association; Central Valley Rock, Sand and Gravel Association, Inc.; Homestake Mining Company; U. S. Dept. of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station; and the U. S. Dept. of the Interior, Bureau of Land Management.

Eight other organizations provided logistical support and network contacts. They included the National Sand and Gravel Association; Aggregates and Concrete Association of Northern California, Inc.; American Society for Surface Mining and Reclamation; California Association of Resource Conservation Districts; San Diego County Rock Producers Association; the Land Reclamation Working Group of the Society of American Foresters; California County Planning Directors Association; and the Urban Land Institute.

Conferees came from 16 States, including California, Nevada, Arizona, Oregon, Montana, Utah, Colorado, Massachusetts, Michigan, Virginia, West Virginia, Connecticut, Illinois, New York, South Dakota, Florida, and Washington, D.C. Others traveled from as far away as Canada, Australia and the United Kingdom to participate and share their knowledge.

During three days of workshops and Showcase Sessions, case studies from North America, the United Kingdom, Australia and Europe were examined. Examples of after-use conversion of mined lands ranged from real estate development of all kinds, to agriculture, forestry, recreation and tourism. In a special Showcase Session entitled "Government's Role in the Reclamation and After-Use of Mined Land", the governmental processes that regulate mining and encourage reclamation in Oregon and California were compared with the processes used by the United States Federal Government and the Province of Ontario in Canada. Field trips, one before and one after the conference, took participants to mining sites converted to agricultural and recreational uses in the Central Valley of California and to sites in the San Francisco Bay area where developmental after-uses could be seen.

This was, by design, not a conventional "paper giving" conference. The workshop format encouraged informal interaction after short introductory statements, often illustrated with slides, by conferees selected for their special knowledge.

The conference established a critical network of people, all with interest and expertise in reclamation and the after-use of mined lands. We hope the connections made during the conference will continue to be useful and productive. We feel that the expertise shared by the conferees will be of interest to others involved in the reclamation and after-use of mined land, not only in California, but throughout North America, and abroad.

This proceedings document is a summary of the three full days of discussion and idea sharing which took place at Asilomar in September 1984. It is a less formal document than is usual in technical conferences. We have tried to reflect the comments and discussion of each workshop fairly and objectively. We apologize in advance for any vital information left out or sage references not acknowledged.

We do hope, however, that the ideas reflected here will stimulate the reader and encourage direct contact with conferees whose remarks are particularly provocative or helpful. The network guide at the back of this book provides the information to facilitate contact by telephone or mail, as convenient.

In addition, a few conferees have identified publications for background reading on topics touched on in their discussions. Footnotes indicate where these are available and how to acquire copies.

We are pleased that the Conference turned out to be the stimulating exchange that it was, and we feel confident in believing that it has contributed to advancements in the state-of-the-art of planning for the reclamation and productive

after-use of mined land. We look forward to seeing the new insights and perceptions gained by Conferees at the "Productive Second Uses of Mined Land" conference put to use by the mining industry and local agencies throughout California and by practitioners throughout the United States and as far away as Europe and Australia.

Don L. Blubaugh, Director
Department of Conservation,
State of California

Norman T. Gilroy, President
The Institute for
the Human Environment

Acknowledgements

Acknowledgements

Many individuals gave generously of their energy and their time, and deserve acknowledgment for their many contributions in making the Conference successful.

The initial Steering Committee meeting in February 1984 included **Zoe Mankoski**, State Mined-Land Reclamation Program Manager, Department of Conservation, Division of Mines and Geology; **Tom Gay**, Chief Deputy State Geologist, Department of Conservation, Division of Mines and Geology; **Norman Gilroy**, President, The Institute for the Human Environment; **Tom Parilo**, Assistant Planning Director, Nevada County Planning Department; **Gene Andreuccetti**, State Conservationist, U.S.D.A. Soil Conservation Service; **Jack Heck**, Chairman, Reclamation Subcommittee of the State of California, State Mining and Geology Board; **Jack Streblow**, President, Basalt Rock Company; **Ray Krauss**, Project Environmental Manager, Homestake Mining Company; and **Bob Matthews**, Senior Lecturer in the Department of Geology, University of California at Davis, and member of the California State Mining and Geology Board.

The following people added invaluable input in the planning of the project: **Don Reining**, Southern California Rock Products Association; **Denton Carlson**, U.S. Forest Service; **James Roberts**, Consultant; **Gene Block**, CONROCK; **Tito Patri**, The Planning Collaborative, and member of the State Mining and Geology Board; **Pierre Mousset-Jones**, Mackay School of Mines, Reno, Nevada; **Carol Thomas**, California Department of Conservation; **Catherine Munson**, Lucas Valley Properties; **Edward "Doc" Merrill**, from the law firm of McCutcheon, Doyle, Brown & Enersen; **Harold Biaggini**, California Cattlemen's Association; **Marion Ely**, Consultant; **Bill Rozar**, San Mateo County Planning Department; **Richard Olendorff**, Bureau of Land Management; **Lowell Chamberlain**, from the real estate investment firm of Johnson, Chamberlain; **Donald Ham**, DRH Investment Company; and **Ed Biaggini III**, Buena Vista Mines, Inc.

The California Department of Conservation's support for the Conference included leadership by **Don Blubaugh**, Director, and **Jim Davis**, State Geologist, and initial funding. We also thank the staff of the California Reclamation Program, including **John Alfors**, Environmental Geology Officer;

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For their help in providing contact with their membership and publicity, thanks go to the **National Sand and Gravel Association;** the **Aggregates and Concrete Association of Northern California, Inc.;** the **American Society for Surface Mining and Reclamation;** the **California Association of Resource Conservation Districts; San Diego County Rock Producers Association;** the **Land Reclamation Working Group of the Society of American Foresters;** the **California County Planning Directors Association;** the **County Supervisors Association of California;** the **Aggregates and Concrete Association;** the **Urban Land Institute,** in Washington, D.C.; **BACMI** and **SAGA** in the United Kingdom; and the **Ruhrgebiet** in West Germany.

Special commendations are due to the facilitators and graphic chroniclers who orchestrated each workshop at the conference. Among them were **Shelley Arrowsmith, Nancy Dakin,** and **Marika Rosen** of The Institute for the Human Environment; **Barbara Evoy, Ken Cole,** and **Lorraine Van Kekerix** of the California Department of Conservation, Division of Mines and Geology; and **Don Friend** and **John Steere** of the University of California at Berkeley. The reporters who prepared preliminary summaries of each session included **Betsy Lloyd, Vicki Santamaria,** and **Jim Munger,** who provided indispensable help in the initial preparation of this manuscript.

Last, but not least, acknowledgment for facilitation and organization of the Conference should go to the staff of The Institute for the Human Environment: **Norman Gilroy,** President of the Institute; **Scott Slotterback,** project manager; **Shelley Arrowsmith,** conference registrar and general coordinator; **Nancy Dakin** and **Andy Gustavson,** researchers into the subject; **Marika Rosen,** pre-conference logistics; and **Phyllis LaVoie,** word-processing.

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WELCOMING REMARKS

Mineral Resource Utilization and Reclamation

SPEAKER

DON L. BLUBAUGH
California Department of Conservation

WELCOMING REMARKS

Mineral Resource Utilization and Reclamation

DON BLUBAUGH, Director, California Department of Conservation (a joint sponsor of the conference), welcomed the conferees on behalf of the State of California. He confirmed the deep commitment of the Department of Conservation to public policy in the area of mineral industry activities -- from exploration for the minerals necessary for society's growth, to production of the raw materials from the earth, to marketing, and finally to reclaiming the land to a condition to be used again.

He pointed out that mining is a major industry in California. A recent count showed nearly 1,000 active mines in California, involving some 40,000 jobs, producing nearly $2 billion dollars worth of non-fuel minerals in 1983, and generating millions of dollars of tax income for the State. Ninety-three counties and cities in the State have adopted certified mined land reclamation ordinances, enabling them to act as lead agencies under California's Surface Mining and Reclamation Act (SMARA), to work with active mine operators on the planning necessary to return mined lands to a useful condition after mining is completed.

The mining industry in California is an important industry that is actively looking for better ways to reclaim mined lands. The potential for reclamation and second use is not just an abstract idea with no real market to "buy" the ideas and put them to good use. On the contrary, California's mining industry is anxious to explore the vital business of reclaiming their properties for profitable second uses.

California's Surface Mining and Reclamation Act (SMARA) is the legislation which established the requirements for reclamation activities in the State of California. It was passed in 1975, with two major thrusts which provide nonregulatory advice to local governments and industry: 1) to identify those mineral deposits that will be needed for mining in the future, and to ensure that they are not lost to mining by the land's being zoned or permitted to uses that would make mining impossible; 2) to require the reclamation of every active mining property in the State to an ultimate condition that is useful for some future purpose.

The Department of Conservation and its Division of Mines and Geology have an active Mined Land Reclamation Program. It provides lead agencies and the mining industry, when they request it, with the technical information needed to enhance the development of realistic, effective reclamation plans for mining properties. California's Reclamation Program is also active in generating general educational materials (including a major publication on mined land reclamation planning in California, which is now at the draft manuscript stage), and in participation in, and providing leadership to, educational meetings, seminars and conferences. All are consistent with the Reclamation Program's general mission of broadening the technical awareness of mined land reclamation techniques and procedures, both in the mining industry and in the land use planning activities of local governments throughout the State.

Mr. Blubaugh pronounced the Productive Second Uses of Mined Land conference open, and wished all of the gathered conferees an interesting and productive stay at Asilomar.

THEMATIC PRESENTATION

Productive Second Uses – A Broadened Potential For Reclamation

SPEAKER

NORMAN T. GILROY

The Institute for the Human Environment

THEMATIC PRESENTATION

Productive Second Uses – A Broadened Potential For Reclamation

NORMAN T. GILROY, President of The Institute for the Human Environment (a joint sponsor of the conference) and a consultant in land use planning and reclamation of mined lands, began with a thematic presentation that summarized the theme of the conference. "Almost every community in the developed world has a mining operation of some kind close to it," said Gilroy. "That's a great many communities, a great many mining operations -- and a great many people affected."

Reclamation of mined lands is an issue of growing concern over a very wide geographical area. Over 40 states in the U.S., most of the provinces of Canada, and most of the countries of Europe now have legislation -- most of it relatively new -- that requires permits for new mining operations and requires reclamation plans as part of those permits.

Yet reclamation for most operations has up to now been virtually synonymous with land stabilization, landscaping or revegetation. Revegetation is, more often than not, seen as a cost to the operation rather than an investment in the future.

In the process, Gilroy feels that many opportunities may have been missed to convert the mining sites to productive second uses that could have created benefits for the mining company and for the local community affected, its governmental agencies, and those who care about the environment.

But what is a "productive" second use of mined land to each of these very diverse interests?

For the mining company, "productive" can mean a second use that produces second profits, new business partnerships and a better working relationship with the local community and critics from environmental interests.

For the community, and the governmental agencies that serve it, it may mean a second use that provides greater certainty about the future of an important piece of land. Better understanding may translate into less confrontation and better day-to-day relationships with local mining companies which play an important part in the local economy.

For those who care about environmental quality, it may mean simultaneous reclamation during the operation, and restoration of the environmental setting after the mining is over.

For the land use developer, it could mean new opportunities for partnerships or acquisitions that provide access to land that is already shaped to fit second use development. Services, access highways and waterways may already be in place, and the property may be advantageously positioned on the growing edge of an established community -- often a community built with the products produced by the mining operation.

For the farmer, a "productive second use" can mean new land to farm and manage. For the forester, it can mean new opportunities for planting of timber or new business opportunities like energy producing fuel wood farms -- and on and on.

Under the best of circumstances, productive second uses of mined land can mean something that potentially works for practically everybody!

"So is the idea feasible?" asked Gilroy. "Have others successfully converted mining land to productive second uses?" Gilroy's research indicates that there are only a few good Case Studies available. The idea is somewhat new, and to put it into practice requires a broad, and perhaps unusual, combination of skills, perceptions, and knowledge not found in many mining companies or consulting firms.

Gilroy then used slides to illustrate a number of examples taken from all over the world, grouping them under the second use categories around which the conference would be structured:

DEVELOPMENT might include offices, industrial parks, high technology centers, commercial development, shopping centers, housing -- or a mix of any of those uses.

- **Larkspur Landing** is a mixed-use project in Marin County, California, on which Gilroy has worked since 1972. The development is on the site of the old Hutchinson Quarry which operated there from the turn-of-the-century until 1972. Conversion took place after most of the mining was complete, and a major ferry and bus transit terminal serving Central Marin is now located on the former truck maintenance area. A high quality office park and theme shopping center now serve the local public where the stockpiling, processing and sales operations used to be. Three phases of housing with dramatic views of San Francisco Bay are being built in the two large quarry bowls that were created during seventy years of mining use on the property.

- **McNears Quarry**, also in Marin County, California, is a large, hardrock quarry operated by Basalt Rock Company, a division of Dillingham Corporation on which Gilroy's firm has also worked as planning consultants for the past 10 years. The quarry occupies a beautiful waterfront site on the edge of San Francisco Bay. In the remaining ten to fifteen years of quarry operations, the land will be shaped under an integrated and simultaneous reclamation process to prepare it for future uses. A 650 boat harbor will be created by flooding the old quarry pit with water from San Francisco Bay, with the quarry's barge loading channel providing access to deep water. A variety of commercial recreation uses will be created along the harbor and the waterfront, housing is planned on the stepped planes created by the quarrying operation, and a network of public beaches and waterfront trails will provide public access to the shoreline in response to the principles established by local governmental agencies.

- The **White Rock** Development in Sacramento is a high-tech industrial park being developed by the Cook Company, on which Gilroy has also served as a consultant. It is on the property of Lone Star Mining, a large sand and gravel operation working on tailings left behind by hydraulic gold mining at the turn-of-the-century. Mined-out areas are filled and regraded to stabilize them and make them ready for new development. Roads and services have been constructed and the subdivision is complete, each step increasing the value of the land in preparation for its second uses. A number of very fine high-tech office buildings are rising on the land where once gold mining and later sand and gravel mining took place, while next door the extraction operation continues.

- At **Coldspring** in Washington, D.C., the Rouse Company proposed a development in the early 1970's that was wrapped around an old quarry. Innovative approaches were used in the design of housing stepped against the steep side of the quarry, creating a dramatic development with each residence enjoying magnificent views over the surrounding landscape.

- At **Corby New Town** in England, a large area of industrial park uses has been created from what was once an old steelworks and iron mining area. An aggressive local City Government, operating under "enterprise zone" provisions, has installed streets and service systems, and has created parcels of land ready for industrial and office development on the edge of the town's revitalized central commercial and housing area. Aggressive marketing techniques are being used to attract new businesses to the area, and former miners and steelworkers are being retrained for employment in new occupational activities.

AGRICULTURE AND FORESTRY are land uses that frequently can be applied as after-uses of mined land. They may replace agricultural land that existed before, or create new productive land where relatively unproductive land had existed before mining took place.

- At **Bush Farm** in England, an experimental farming facility is sponsored jointly by industry and the government. The return of the extraction site to agricultural land is, in fact, really a third use of the mining site. Once sand and gravel extraction was complete, a clay liner was installed and the pit was refilled with waste materials from the Greater London area. Then, when the site was full, gas collection pipes were installed and a domed cap of clay added to control the methane gas generated by the sanitary fill. Topsoil was placed over the clay layer. The lessons of the Bush Farm experiment are now being applied at other sites throughout England and Wales, to very good effect.

- At **Basalt Rock Company's Healdsburg operation,** Gilroy's consulting firm has planned a reclamation plan for a large sand and gravel extraction that extends below the water table. A 17-acre area has been refilled with sediments and fine materials removed by the gravel washing process at the plant. The land has now been replanted with wine grapes, and is producing crops with as high a yield and quality as adjacent land that has never been subjected to mining.

- In the **Welsh coal fields,** surface mining goes on side-by-side with reclamation. Mining is seen there as a temporary use, moving across the surface of the land, but replacing land surface behind it that is of a similar, or superior, quality to that which existed before. More often than not, the land acquired for mining reverts eventually to its original owner after mining is complete, allowing the farming and grazing activities that originally existed there to resume after a delay of a few years.

- **In Scandinavia and parts of the United States,** forestry is an extremely productive second use of mined lands. New highly productive cash crops are being developed, both through timber harvesting and through the creation of fuelwood farms in which rapid growth trees are planted and harvested to create firewood and wood chips for burning and, in some cases, biomass for conversion into energy through various modern processes.

"RECLAMATION AS ART" is an unusual, but highly interesting and productive, second use opportunity for mined land.

- A **spiral jetty at the Great Salt Lake** in Utah was designed by artist Robert Smithson to transform a once-abandoned site full of debris and unwanted remnants into a new landscape. The publication Reclamation Works, by Cherie Kluesing, describes it as a monument to transformation and nature

created in a site which embraces biological and human activity. It speaks to us about ourselves, our society, our land, and our conceptions.

- At the **Johnson Pit near Kent, Washington,** artist Robert Morris has created a terrace configuration that has reclaimed a 4 acre site, stabilizing the earth and creating a pleasing sculptural landscape.

TOURISM is another productive second use with great potential for mining sites. The landscape created by the mining operation may be converted into a tourist attraction - or the mining activity itself may be of sufficient interest, historic and operational, to attract visitors and be the center of a tourist attraction in its own right.

- At **Thorpe Park** near London, England, the Amey Roadstone Company has created a very successful theme park which attracts hundreds of thousands of visitors annually from the Greater London area which it serves. Ideally located near Heathrow Airport and with major highway access, Thorpe Park is an excellent example of a second use that was created and operated by the mining company that ran the extraction operation in the first place.

- **Big Pit** in South Wales is an Open Air Museum in which visitors can walk through a deep coal mine 1,000 feet below the ground and see how miners and their pit-ponies lived and worked in "the old days".

- **Beamish Open Air Museum** in the north of England is a similar facility in which visitors can ride the old mine railway, go down into the mine, visit the village which served the colliery, and see how miners have lived over the last 100 years of the Industrial Age.

- At **Llechwed Slate Quarry** at Blaenau Festiniog in North Wales, visitors can ride an inclined railway into a huge slate quarry deep below the ground to see the caverns where men and children worked not so many decades ago, sometimes in complete blackness. On the surface, visitors can see the ancient art of slate splitting, a practice that is still carried on today in the active mine on the hill high above the visitor facility.

- **Butchart Gardens** in Victoria, Canada, is another, but very different, tourist facility in an old quarry. There, the quarry workings have been converted into a beautiful garden setting that attracts almost a million visitors a year. Buildings on the site are used as conference facilities and for special events, shows, fireworks, etc.

- At the **National Stone Center** in Derbyshire, England, the local stone industry proposes to use a group of four

quarries as a "hands on" museum. Walking trails cross the site and link to crosscountry hiking trails that run throughout the region. Buildings on the site will be used for education, meetings, and conventions, providing the stone industry with an opportunity to educate the general public and representatives of local government throughout the country about the importance of their work.

- In **Hamm**, West Germany, the buildings and grounds of an old coal mine have been converted into a very beautiful horticultural show site, which will later become a permanent park to serve the people of the region. A performing arts center has been created in the old gymnasium and locker rooms from the former coal mine to serve the people of Hamm.

SPORTS AND RECREATION ACTIVITIES are also productive second uses that can generate benefits for the residents of the local community and for the mining company involved.

- At **Hamm**, West Germany, a variety of children's playgrounds and public parks have been created on the site of the old coal mine mentioned earlier.

- At **Heerlen** in the south of Holland, a horse-racing and trotting track and year-round skiing facility have been created from the reshaped spoils areas of an old colliery site. The initial conversion was accomplished using governmental funds, but the sports facilities are now operated by private companies under a lease arrangement.

- In **Larkspur**, California, a hotel and international tennis center was once proposed in the bowls of an old quarry. The hotel was to be located on the central ridge overlooking San Francisco Bay, and center-court stadium seating was to be on slope banks created by a balance of cut and fill on the floor of the old quarry.

- In the **Ruhr** area of West Germany, a number of very beautiful and useful Regional Parks have been created on the derelict land and spoils tips of the collieries that operated there between the mid-1800's and recent times.

- At **Corby New Town** in England, an 18-hole golf course has been created on rolling land reclaimed from an old open cast colliery site.

- At **Holme-Pierrepont** in England, a major international watersports center has been created from a sand and gravel extraction operation, with the mining company working with the local agencies in the area to shape the land. The sports center now has a 2,000-meter straightaway racing course, wind surfing, lakes, sports fishing areas, and a canoe slalom training course. The site is extensively used for public activities, ranging from balloon launchings to horse shows, and to international rowing events, power boat races,

water-skiing, camping, fly-fishing tournaments, etc.

Gilroy pointed out that the Case Studies illustrated in his presentation demonstrate that reclamation can involve a number of categories of land use and can apply to a wide variety of types of mining sites in a wide variety of settings, urban and rural. Yet, as Gilroy pointed out, quite a few of the projects he had illustrated were not only after-uses but also afterthoughts -- uses that were applied to the land long after the mining plan was first conceived and, perhaps, long after the mining operation itself was complete. Many, though successful in themselves, required large investments of money and effort just to compensate for short-sighted actions taken during the mining period. In some, slopes had to be restabilized and regraded to compensate for quarrying designed to meet safety standards but far too steep to safely allow development at the foot of its slope. In some cases, service trenches had to be blasted in the solid rock floor, instead of being dug in a blanket of fill that could easily have been placed as a part of the mining operation. Often, landscaping, revegetation, erosion control and land enhancement could all have been done as part of the ongoing mining operation in a way that would fit the needs of both the mining operator and the developer of the future use.

To do those things, however, would have required careful long-range planning from the outset of the operation -- something that is not often found in mining operations today. "Poorly planned operations result in lost capital and lost opportunities," said Gilroy. "Sometimes, the losses are in public money, as governmental agencies find it necessary to make huge investments to reclaim 'derelict land' left by the mining operations of the past. The ultimate loss may fall to the mining company, however, as it 'misses out' on the increases in land value that might have been possible at the time of sale or conversion of the mining property after mining is complete."

In other projects, however, the after-use and the mining use have been coordinated with one another, with each getting the best out of the other. "That's the best of all worlds," said Gilroy, "but it only comes about through knowledgeable planning and forethought, coupled with day-to-day management and marketing."

Gilroy then went on to explain the format of the conference, pointing out that there would be an opportunity to discuss conceptual ideas and nuts-and-bolts solutions; and to look at what others have done, both in the United States and abroad, to facilitate the reclamation and productive after-use of mined land.

KEYNOTE PANEL

Four Views of the Process of Creating Productive Second Uses On Mined Land

PANELISTS

A. ALAN HILL
President's Council on
Environmental Quality

BRUCE WOOLPERT
Granite Rock Company

HARRIET BURGESS
The Trust for Public Land

CATHERINE MUNSON
Lucas Valley Properties, Inc.

KEYNOTE PANEL

Four Views of the Process of Creating Productive Second Uses On Mined Land

Four segments of our society participate most strongly in decisions that affect the second use of mined land and make it more, or less, productive. The mining industry is the prime mover in the mining process and controls the eventual shape and quality of the mining site. Government represents the community interest, regulating land use and setting requirements and standards for mining projects in their jurisdiction. The land development industry has the expertise to convert mined land to productive second uses. Conservation interests are vitally concerned with the quality of the environment. Each has a role to play in the decision making process that dictates the quality, scale and nature of the second uses allowed on mined land - and each has a different definition of "productive" as it relates to second uses.

A. ALAN HILL, Chairman of the President's Council on Environmental Quality in Washington, D.C., represented the view of the United States Government and discussed the process involved in evaluating a project proposal for a mining operation or a second use of mined land. The National Environmental Protection Act (NEPA) of 1969 directs the actions of Federal agencies in evaluating the potential impacts of projects and provides for public information and input in early stages of an action. In situations where a Federal agency is intiating a "project with significant environmental impact" as delineated by NEPA, an Environmental Assessment (EA) is made. This brief document helps the agency to determine whether the proposed action is of such a magnitude as to require the preparation of an Environmnetal Impact Statement (EIS). An EA reaches one of two conclusions: 1) a decision to prepare an EIS, or 2) a Finding of No Significant Impact (FONSI), which means that an EIS need not be prepared.

According to Hill, the primary purpose of an environmental impact statement is to serve as an action forcing device to insure that the policies and goals defined in NEPA are infused into the ongoing programs and actions of the Federal Government. It provides for full and fair discussion of significant environmental impacts, and informs decision makers and the public of the reasonable alternatives which would avoid

or minimize adverse impacts as well as enhance the quality of the human environment. An environmental impact statement is more than a disclosure document. It is used by Federal officials in conjunction with other relevant materials to plan actions and make decisions.

Hill then described the intent and implementation of the U.S. Surface Mining Control and Reclamation Act of 1977, together with some of the amendments to that Act that have made development of post-mining uses more feasible by removing many restrictive conditions and interpretations. The basic land use objectives of the Act, as amended, are that: 1) Land should be returned to the approximate pre-mining condition, except in the case of mountain top removal (where this is not possible), and in cases where a higher or better use is desired; 2) After mining, the land should be left in a condition that makes it possible to re-establish the pre-mining use at a comparable level of productivity. More productive uses, or uses that are better for the community, may be developed as long as the pre-mining use would also be feasible; 3) Variances from the strict application of the Act are authorized to enable land to be improved during the reclamation process. One of the primary objectives of the Federal Government in this area is to enable reclamation to be more responsive to local needs and conditions, so that reclaimed land can support the most desireable land use. In most cases, wildlife enhancement is given the greatest priority.

Hill urged the mining industry to go beyond the letter of the law in environmental matters and attempt innovative ways to create environmental benefits. The result would be an improved public image and increased project potential. He did not put the burden only upon the industry however, but felt that government should also take progressive positions regarding reclamation and second use. Government regulators should make allowances to accommodate innovative methods to improve the environment as a part of normal activities like mining that are temporarily disruptive. Through an open discussion of potential impacts, a re-directing of regulations to enhance reclamation possibilities, and a concern for public information and input, the Federal Government is trying to do its part in the development of productive second uses.

BRUCE WOOLPERT, long-time Board member of the National Crushed Stone Association and President of Granite Rock of Watsonville, California, represented the mining industry in the Keynote Panel. Woolpert pinpointed lack of communication as the stumbling block in the use of land for mining and in the development of productive second uses. He emphasized the value of consultants in forming liaisons with local communities and with regulatory bodies. Though Woolpert felt that California is the leader in reclamation guidance and practice, he reiterated the need for progress in working out solutions

land use problems that will satisfy the needs of the public, the government and the mining industry. He showed his appreciation for the conference by pointing out that it helped him see others involved in land use problems not just as antagonists, but as individuals trying to resolve conflicts and plan together for the future.

HARRIET BURGESS, Vice-President and Washington Government Liaison for The Trust for Public Land, spoke for conservation interests. She described the Trust's programs to "conserve land as a living resource for present and future generations". Often the Trust acts as a facilitator in acquiring lands for public use, and has conveyed more than 200 parcels of land valued at over $135 million into public ownership. By actively promoting local land trusts, The Trust for Public Land has helped create numerous inner city parks and gardens, often owned and cared for by local residents, and they have provided rural, suburban and urban communities with effective methods for conserving local lands with scenic, historic and/or agricultural value.

According to Ms. Burgess, the Trust for Public Land is an example of an environmental group that has become increasingly well-known as an organization that finds innovative ways to resolve land use disputes. Since its inception, the Trust has involved the corporate community in their projects, "yoking business expertise to the land conservation plow". Because the Trust is a not-for-profit organization, land owners who donate their land or make a concession on price can claim the maximum tax benefits allowed by law. Ms. Burgess indicated that The Trust for Public Land might offer the mining industry valuable insights about, and creative planning for, productive second uses of mined land, and that it is an untapped resource in many aspects of land use planning.

CATHERINE MUNSON, President of Lucas Valley Properties in Marin County, California, and a broker, investor and developer with interests in the San Francisco region and the Palm Springs area, spoke for land use development interests. She indicated that, although the title of the conference may seem to encompass a very specific field of land use, the issues discussed would have universal applicability for developers. She described development as not only the second use of property, but rather a process of continual change of use. One drawback in the area of development seems to be that humanistic alternatives often fall by the wayside because they are not economically feasible. Only in the last 25 years have development firms become aware of a need for new approaches and, as a result, development consultants have been investigating more imaginative ways of using mined land. Profitable results are still necessary for a project to work,

a process that coordinates all participants more carefully can ensure greater success.

According to Ms. Munson, most mining companies have not been aware of the high risks involved in the land use development process. These risks include inflation rate fluctuation, demographic changes, shifts in community and industry needs, environmental concerns and general market forces. In planning for second uses, Ms. Munson urged that these factors be carefully considered by all the parties involved, as the outcome of the development process would undoubtedly hinge on what occurs in each of these areas.

The presentations of the keynote panelists were an indication of the variety of information to be exchanged at the conference. The attitudes of each sector involved in the process of developing productive second uses were clarified, yet at the same time an appreciation for each other's position was inherent in all the remarks. The session set a tone of congeniality for the conference and significantly enhanced the cooperative exploration of issues relating to the development of productive second uses of mined land over the next three days.

EXPLORING NEW IDEAS

Broadened Horizons – New Approaches for the Mining Industry

WORKSHOP PANELISTS

WILLIAM CARTER
National Crushed Stone Association

ROBERT A. GOOD
Kaiser Sand & Gravel

Broadened Horizons – New Approaches for the Mining Industry

In the changing business world, mining companies are increasingly being required to consider environmental issues, to work closely with their neighbors and surrounding communities throughout the mining operation, and to leave their properties in usable condition once mining is complete. Mining companies, large and small, handle not only sales and extraction, but also must play a significant role in the process of converting the mining site to a second use. Reclamation is a relatively young and growing field. New approaches that lead to productive second uses of mined land can give mining companies more options in the reclamation process.

WILLIAM CARTER, President of the National Crushed Stone Association in Washington, D.C., gave a brief overview of the current state of the aggregate industry and outlined some of the pressures coming to bear on that industry. Urban sprawl, environmental concerns, and limited resources have all forced mining companies to become as productive as possible in order to meet the needs of the construction market and growing constraints and restrictions. One approach to alleviating some of those pressures is to develop what Carter called "parallel multiple land uses". In this approach, mine operators work in concert with others in their community to create situations where the mining process is directly meeting the needs of another constituency. He gave the example of the Montclair State Teachers College in New Jersey, which was looking to expand its campus but was limited by the topography of the area. The college worked with a mining company, which mined a large hill behind the campus and left a rolling swale on which the college could place their new buildings. Carter also pointed out that it is often people working outside the mining industry who have seen ways to develop productive second uses, and frequently they have had to convince mine operators of the efficacy of their plans. He encouraged the industry to be open-minded and to listen for projects that might both meet their mineral needs and allow parallel development.

Carter described the competition sponsored by the American Society of Landscape Architects and the National Crushed Stone Association. He saw it as an example of an interlocking

of the interests and efforts of two very different disciplines that could create a new bridge for understanding between two very different disciplines. He also cited several examples of unique second uses that have been developed on mined lands over the last few years. They include swimming clubs and municipal beaches, residential communities on terraced quarries, and the use of underground space as offices, refrigerated storage and military operations.

According to Carter, the key to developing new approaches is to design a firm operating plan that clearly identifies the deposit, develops a mining plan, specifies the operating phases, and then uses equipment down time to reduce the cost of development of the property during mining or after mining is complete.

ROBERT A. GOOD, President of Kaiser Sand and Gravel and President of the Northern California Aggregate Producers Association, followed Carter with his perspective on new approaches to the reclamation process. Good felt that each mined land reclamation project is unique and must be planned and implemented in a manner consistent with its environmental and economic setting. Imagination, common sense and a recognition of need are essential factors, and basic to reclamation plans that are good for both the land owner and the community.

Good shared six of his company's plans for reclamation to highlight the variety and specificity of reclamation plans. The first was an aquatic park, created from a depleted sand and gravel pit. The second was a flood control and ground water percolation system created from depleted sand and gravel pits, to be managed by a local Water District. In this project, Kaiser is cooperating with two local competitors who are operating from the same deposit. A third example described industrial land that was created by filling a depleted sand and gravel pit with silts from the wash plant and overburden from nearby mining areas. A fourth project saw the return to agriculture of depleted river terrace lands by permitting river water, laden with erosion silt during heavy storm periods, to flow into depleted pits, dropping its silt load before flowing back into the river downstream. Revegetation of a depleted sand pit with native plant species was a fifth project, with part of the land returned to open space and part potentially developed for light industry. Sixth, Good mentioned a return to open space in a hard rock quarry with orderly benching and planting of the area.

Good pointed out that not all potential second uses of mined land can be expected to yield large profits to the mining company. An open space or green belt may be "productive" in local terms in a rural area or urban fringe. Land closer to the urban areas tends to offer more alternatives because the

chances of recovering the cost of reclamation are much greater. But with a careful analysis of the particular characteristics and opportunities of each site and a careful review of alternate approaches for reclamation, the mine operator can create an effective second use for the property that benefits both his company and the community of which it is a part.

DISCUSSION focused on three primary concerns. The first issue was the contrast of operations between urban and rural lands. Some participants felt that reclamation opportunities are more diverse on urban property, rather than rural properties, given the higher inherent value of urban land. Productive second uses seem much more limited in rural areas, and local jurisdictions often have specific demands for reclamation to uses or conditions similar to those which existed before mining took place. This issue was intertwined with economic concerns regarding reclamation. Companies cannot afford to lose money on reclamation; investors prefer capital outlays which show quicker, more certain returns. In rural areas there is often little payoff in reclamation, and therefore little incentive to work at it. The fact that mining companies often lease their land for the period of the operation also contributes to a lack of incentive on the part of mine operators to develop comprehensive second use plans since they have little opportunity to participate in the growth in value that might occur. However, many leases now recognize the Reclamation Plan as part of the responsibility of the mining company from the beginning, thus forcing the issue to be resolved early in the game.

A second economic issue discussed was the requirement for bonding for reclamation. Most participants thought bonding was unnecessary, and that bonds rarely covered an adequate proportion of the reclamation costs involved. However, no alternatives to bonding to assure reclamation were suggested.

The third topic of discussion was the changing of regulations and the subsequent effect on a mining operation. Since many mining operations have a very long life, there is a strong likelihood that regulations controlling operations, development, and potential second uses will change during the life of the project. Most participants felt that, given the high costs involved in creating long range comprehensive plans that would take advantage of new approaches to reclamation, it would be necessary for the mining operator to have some protection from the effects of shifting regulations on property and operational rights. Without a solid footing on which to base long term economic and developmental projections, it is difficult for the industry to take the kinds of risks some feel reclamation projects to be. However, the group clearly saw, and discussed, the potential benefits available to the mining industry that were contained in Mr. Carter's "parallel multiple

use" idea and in Robert Good's "site specific reclamation plans", and felt the idea of "productive second uses" was well worth further exploration and experimentation.

EXPLORING NEW IDEAS

Working Together – New Opportunities for Collaboration Between Industry and Government

WORKSHOP PANELISTS

MATT SHUMAKER
Bureau of Land Management

RAY KRAUSS
Homestake Mining Company

THOMAS PARILO
Nevada County Planning Department

JOHN J. HECK
California State Mining & Geology Board

Working Together – New Opportunities for Collaboration Between Industry and Government

The relationship between the mining company and the governmental agencies that represent the local community can often be an uneasy one. However, if a cooperative working relationship can be established, both may benefit from a long-term mutually compatable interaction. Arriving at cooperative relationships that work can, however, be difficult and time consuming, but with patience both the mining company and local government can share in the positive results of the effort.

MATT SHUMAKER, Area Geologist, Bureau of Land Management, California Desert District, discussed some of the current problems that face collaborative efforts on public land under BLM administration. A number of poorly managed mining projects in the past have led to a call for more restrictions on mining on federally held land, a factor that has worked to the detriment of projects that are well-managed. Bulldozing trails in wilderness study areas, drilling three hundred foot shafts to obtain a few samples, and collecting vegetation without permits are just some of the violations he has seen. Unfortunately, the BLM does not have enough personnel to adequately patrol all of the federal lands under its control, much less watchdog each mining operation.

In order to enhance cooperation and limit abuses, Shumaker suggests that mining companies working on federal land should keep BLM service managers informed of their operating plans and also suggests that the companies take the responsibility of becoming as informed as possible about the appropriate regulations that control operations on federal lands. In return, the government agencies with jurisdiction over a mining project need to establish better systems of internal communication to more closely meet the needs of the mine operator and respond to the concerns of local agencies and individuals.

Speaking directly to the issue of second uses, Shumaker concluded that often, on isolated BLM lands the best second use of mined lands is a return to the orginal use -- often open space that serves as a wildlife habitat. This may not always be

financially rewarding to the mining operator, but it is a necessary and productive second use.

RAY KRAUSS, Environmental Manager for Homestake Mining Company's McLaughlin Gold Mine Project in Northern California, cited his company's "consensus-building" approach to the permit process as one example of the potential for partnership in the mine development process. "Consensus-building", though often costly, complex and time consuming at the beginning, is more likely to result in success with the permit process and may help avoid problems and law suits in the future. Success in the permit process has been especially critical for the McLaughlin Project, which will have obtained 239 permits before extraction operations begin as planned in the first quarter of 1985. The consensus-building approach serves the public interest as well, providing a step by step process of communication and decision making.

According to Krauss, the first step in Homestake's procedure was to identify the requirements for the project by talking to government regulators. Next, Homestake contacted local, state, and federal personnel related to the project at all levels of authority. In the third step, feedback was sought from public and regulatory agencies. In this way, their ideas and recommendations could be included in the design of the project.

Homestake was careful to give as much information about the project as possible to the government officials involved in the permit process. At this point, a time consuming, yet critical, process began to generate a consensus that the project will be beneficial. For consensus-building to be effective, Krauss said, elected officials must know that support of a project will not become a political liability, and Planning Directors must feel sure that approval will not threaten job security. A clear demonstration of public support strongly influences decision makers.

A thorough EIS can be of great value in a project of this kind. It clarifies the company's real interests in contrast to those perceived by the public and supports the company's intentions through independent analysis. Homestake's next step was to contact environmental groups to demonstrate to them that Homestake had a long-term commitment to the community and to show that their project was part of a well considered transitional land use program. Homestake strengthened its case by proposing the use of a pollution-monitoring system to insure air and water quality -- a quantitative measure that helped allay public fears of environmental degradation and showed Homestake's willingness to work together with the community.

Krauss then pointed out that the success of the "consensus-building" process hinges primarily on the ability of the mining

company to educate the public about the community's reliance and dependency on mineral products, and to bring them to an understanding of mining as a transitional process in land use management. Community involvement in the development of a second use plan can help bring about consensus on a project. Heightened awareness is a positive force.

Although Krauss feels that "consensus-building" is time consuming and adds complexity to the planning process, this cooperative approach to planning serves the public interest, while meeting the mine operator's needs as well.

THOMAS PARILO, Assistant Planning Director, Nevada County, California, agreed with Ray Krauss on the importance of community involvement in reclamation projects, but felt that mining companies need to do a better job of educating the public about outstanding reclamation projects. According to Parilo, communities in the foothills of the Sierra Nevada in California have experienced a major change in the public attitude in recent times. Mining is no longer seen as an essential part of the local economy, and residents who have relocated from urban areas are wary of mines and mining operations.

In the face of this resistance, Parilo believes that mining companies must step up their efforts to improve their public image and their commitment to the public interest. Government can also reach out to support industry by clearly defining their role to the mining company and to the public. Ideally, the government should serve as a facilitator to both public and private interests, not as a referee between feuding factions. Direct, honest communication can avert adversary relationships between the mining company, the regulatory agencies and the decision makers who represent the public interest. Parilo encouraged mining companies to become engaged in early public debate about their project, and to realize that all projects must be evaluated in terms of the public interest before final permits for operation can be approved. In his mind, the solution to the problems inherent in the process lies in cooperation, not in confrontation.

JOHN J. (JACK) HECK, a current member of the California State Mining and Geology Board and former Manager of Engineering and Maintenance for Kaiser Sand and Gravel in Pleasanton, California, outlined the crucial steps in the planning of a successful reclamation project. His approach also reflected the idea of cooperative approaches to planning. Heck felt that the second use plan was clearly the responsiblity of the mining company and that a comprehensive plan should be designed during the permit process. The mine operator should identify alternative uses that are congruent with the infrastructure of the site, that reflect the future development

trends of the surrounding community, and that allow flexibility in actualizing the second use plan.

Heck stressed that mining plans cannot be done in a vacuum. Mining companies must involve all necessary levels of government, check long-range General Plans carefully, and develop close contacts among agency staff. Communication with key community leaders is an important part of the process and establishes good feelings in the community as a whole. Heck stressed the importance of a team approach to bring the planning and permit process to a successful conclusion.

DISCUSSION focused on three topics. First was the question of local versus state control of decision-making processes. Concern was expressed that some localities were too parochial to make reasonable choices about mining issues which have regional implications. They "didn't get the Big Picture". On the other hand, state officials often seem to be spread too thin for effective management. A possible solution seemed to be the creation of a stronger long-range plan that would be applied at a state and county level and would identify mineral needs and potential development over a twenty to fifty year period. This kind of plan would allow for long-term needs and give stronger certainty to secondary use plans.

A second topic discussed was the need for education at all levels in the mining industry. Consumer awareness was seen as vital to successful development plans. A third issue spoke to the relative youth of the concept of collaborative planning. Most cooperative planning is still focused at the permit approvals stage of the process, and the second use plan is still often seen as a selling feature for the project rather than an important process in its own right. In order to broaden the scope of second use planning, collaborative efforts must focus more on communication, education and cooperation.

EXPLORING NEW IDEAS

Working Together – New Opportunities for Collaboration Between Industry and the Developer

WORKSHOP PANELISTS

CATHERINE MUNSON
Lucas Valley Properties, Inc.

GENE BLOCK
CONROCK Company

EDWARD "DOC" MERRILL
McCutcheon, Doyle, Brown & Enersen

Working Together – New Opportunities For Collaboration Between Industry And The Developer

It is important to clarify the objectives of the mining operator and the land use developer and identify their areas of common interest and points of difference if new opportunities for collaboration are to be created between them. The way a mining site is developed and positioned in the market can effect the range of second use investment and development options open to both the mining company and land use developers. An understanding relationship between the mine operator and the potential developers is a key to the creation of a productive joint effort. Yet each has much to offer the other in working toward a production and profitable second use for a mining property.

CATHERINE MUNSON, President of Lucas Valley Properties, a real estate broker, investor and developer with property interests in both the San Francisco and Palm Springs areas, began by discussing the land use process from a developer's point of view. She was critical of developers for their lack of awareness of the needs of the mining industry and the opportunities that lie in the conversion of mined lands to productive second uses, but indicated that the primary problem lay in differing expectations regarding return on investment over the time involved in the land use process. A mining operation may look for quarterly cash flow income, but is used to working over a long, perhaps ten to twenty year, period. The developer expects to hold on to a property for no longer than three years.

These conflicting expectations make the initiation of a productive dialogue leading to a potential partnership between developer and mine operator even more difficult. Yet if both parties understand the economics of each other's business, it could be quite possible to design projects that will be successful for both the developer and the mining operation at each stage of development. In order to shape the project for success, Ms. Munson felt that developers should ideally be involved in initial planning on appropriate projects. This "ground level involvement" would secure future plans for the mine site and strengthen both the industrial and the development processes that lead up to a productive second use

for the mining property.

GENE BLOCK, Vice President and Properties Manager for CONROCK, a large mining company based in Los Angeles, followed with his perceptions of the opportunities for collaboration. According to Block, the primary objective of the mining company is to maximize profits by recovering as much marketable material as quickly and easily as possible. However, today that also means leaving the land in good condition for second uses. CONROCK is able to combine both the mining and development process within its own divisions, thus simplifying communication and maximizing benefits. Although Block recognizes that not all companies are large enough to work this way, the same continuum from mine to after-use development applies to most situations.

To be successful, it is essential to design the mine project from the very beginning with after-use in mind. The structure of the quarry or extraction area effects the eventual use and can limit potential uses drastically if not done thoughtfully. As the operator approaches final phases of extraction, then the developer should begin to take a more active role influencing the direction of the project. The key to the process is for both parties to realize that maintaining the property in the best possible shape is beneficial to all concerned. Although the mine operator and the developer may have very different needs and desires, working together to recognize and achieve common goals is essential.

EDWARD "DOC" MERRILL, lecturer with the Bar Association and real estate attorney and partner with McCutcheon, Doyle, Brown & Enersen of San Francisco, followed with an overview of the development process from a real estate point of view. He was critical of the kind of project analysis that focused on short term cash flow. He encouraged taking a long range view, though he recognized the difficulties in accurately forecasting needs, demands and growth trends.

Merrill cited a number of tax laws that may benefit the long-term project and described the "cast of characters" at work in the development process. He discussed the possible tax opportunities available in U.S. Tax Law Section 1237, stating that if a property meets with certain qualifications it is possible to obtain capital gain treatment on its return where it would otherwise be treated as ordinary income under the tax laws. To qualify, the property must have been held for a period of 5 years without substantial improvements (e.g., installation of roads or services, subdivision, etc.). A property held for a 10 year period, however, could be improved to some degree and still qualify for the tax treatment suggested. The opportunity is only available to an organization

which is not "in the trade" of subdividing and selling land, and frequently that creates the need to form a new company or subsidiary to serve as the landholder. Generally, this type of tax opportunity is not available to a corporation but is available to a partnership or other business entity that meets the requirements of the tax code.

If a property has been substantially appreciated (improved) during the holding period, it may be possible to contribute it to a corporation or a partnership essentially tax free.

Merrill discussed the advantages of forming a Development Corporation. That format would provide certain liability protection, an opportunity for issuance of different classes of stock or bonds, preferred returns to some of the holders of different classes of stock, cross-purchase agreements (buy-sell agreements between the shareholders under certain conditions), and the opportunity to go public when the time is right.

Partnerships and joint ventures can be extremely flexible arrangements. They would have some of the advantages of the development corporation, but might fit the particular needs of a situation better than the corporate approach. A limited partnership would have the advantage of providing limited liabilities to some of the players by placing management of the land and the investment in the hands of a highly qualified general partner.

In a partnership, tax benefits may be allocated to the partners on a selected basis, making for a very flexible relationship that works for everyone involved. However, when forming a partnership, it is important to look carefully at the needs of each of the parties involved, their strengths and weaknesses, and their ability to carry out the responsibilities expected of them by the partnership. Partnerships are, however, a good vehicle because they provide lots of flexibility.

Merrill then described "arms length formats" (including long-term lease arrangements, short-term leases, options to purchase, long-term contracts, consulting contracts, etc.), any of which could be appropriate depending upon the circumstances involved.

Merrill warned that the number of options are likely to be as varied as the number of situations on the ground. A highly qualified and experienced real estate attorney can be very useful when mining land with after-use potential is acquired or leased in the first place, and in mid-project when there is a need for additional capital, for moving of fixed assets on the balance sheet, or for creation of new partnerships which can bring special expertise and economic capability to the mining and after-use enterprise.

The landowner is often a key player in the mining and

after-use pictures. He often has very little expertise in development, but is most interested in capital gains. The mining company usually focuses on short term profit and often allows the extraction process to have priority over environmental concerns. The developer has the ability to evaluate market forces and can inject creativity into the second use. Consultants play a supporting role through their knowledge of the details: geology, reclamation and landscape architecture. The investor often is a vital contributor, especially over the long term. Investors need to have big capital to support long-term projects that ensure "earnings", not quick profits.

Merrill felt that the government could take a wide variety of roles, depending on the project. In some cases, the government is the landowner (e.g., BLM, the U.S. Forest Service, etc.). In others it is the consultant (e.g., an advisor in forestry and agriculture). Potentially, in others, government could be an investor with large capital assets in need of markets for investment. He suggested that a look at the multiple roles played by government might open up many new possibilities for viable and popular economic solutions to development and second use problems associated with mined lands.

Merrill reiterated that planning for intensive development, whether it is rehabilitation of a mining site or restoration of a waste disposal site, must ensure that the property is maintained in "salable" condition. He suggested the use of "development agreements", in which government and the operator or developer can enter into a contract that defines the later uses and the densities of use that will be allowed on the property. The agreement requires the governmental agency to protect the necessary zoning on the property. It also commits the operator/developer to develop the properties in a certain way and under certain agreed terms. The approach has the effect of reducing the uncertainties on both sides, and it thereby reduces the risk to each. It can be an attractive solution for both government and industry in many circumstances. It can, however, reduce the flexibility available to each at a later time (flexibility to make political decisions, flexibility to exploit a particular market condition, etc.), and is only acceptable and workable in a situation where both government and the landowner perceive, and value, the benefits it offers.

Merrill urged that mining companies and developers look for flexible solutions to second use planning. Partnerships and joint ventures designed to suit the after-use potential of individual projects can enhance the likelihood of success for both the mine operator and the developer involved. Successful joint ventures depend, however, on close communication, cooperation and understanding between the parties involved.

DISCUSSION focused on exploring possiblities for cooperative planning between all parties involved in the initial stages of project development. The extraction process is long-term and effectively delays the day when development or conversion to second uses can start. Developers are generally unwilling to invest much money in projects that may be ten years down the road. On the other hand, mining operators are reluctant to give developers a strong voice in the long-term management of their mining property. The group discussed the concept of giving developers the responsibility for creating a second use plan for the property in return for a right of first refusal of development rights at an agreed time close to the time when the property is ready for conversion to a second use. In return, the mine operator would agree to leave the land in a suitable condition to accommodate the planned second uses.

It was pointed out that financing the various stages of a project also presents major hurdles for both the mine operator and the developer. Banks are often unwilling to loan money without the security of a strong second use plan and some banks are even unwilling to take risks on the mining operations themselves. Detailed financial planning involving all parties in a project could strengthen collaborative efforts, making the mining and after-use project more acceptable to financial sources.

The final point of discussion echoed a theme heard in other workshops: education is of primary importance in creating working partnerships. Both mining operators and developers felt that they needed to inform each other of their concerns and of their respective expertise. They agreed that the prospects inherent in a collaborative working relationship are worth the effort.

EXPLORING NEW IDEAS

Encouraging Second Use Opportunities on Public Lands

WORKSHOP PANELISTS

DENTON CARLSON
USDA Forest Service

RICHARD DEERY
Bureau of Land Management

REGINALD REID
Bureau of Land Management

BLAND RICHARDSON
USDA Forest Service

Encouraging Second Use Opportunities on Public Lands

The Federal Government is the largest owner of land used for mining in the United States. Yet, mining projects on public land are often reviewed and approved under very different regulations and requirements from those used for developmental projects. The differences between the two processes creates difficulties in combining second use programs with mining activities in a single permit application. Innovative thinking, and perhaps some change in the methods and regulations used by the Federal government, may be needed if the second use potential of mining projects on public lands is to be realized.

* **DENTON CARLSON**, Director, Minerals Area Management Staff, the U.S. Forest Service in California, began by considering the process of reclamation most often seen by the Forest Service, one of the largest Federal land owners. From the land manager's perspective, mining is an interim use of land which results in two products: the mineral commodity or ore and the final land form and environment. Because surface mining actually changes the shape of the land, it represents an opportunity to be captured as much as a problem to be mitigated. Seen from this positive perspective, reclamation becomes a unique and rewarding challenge.

According to Carlson, the direction, objectives and standards used in reclamation must be approached in specific ways to meet the challenge of creating truly productive second uses. Direction for reclamation must come from long range plans that are derived from, and reflect the intent of, the overall Forest Plan. Objectives for reclamation must satisfy long-term needs and be both project and site specific. Performance standards must ensure that reclamation objectives are met. They should be based on scientific knowledge and must be quantifiable and measurable -- yet they must also provide the industry with options. When mining and reclamation projects meet these criteria in the development of their proposals and procedures, greater success is ensured.

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RICHARD DEERY, Geologist with the Washington Office of the Bureau of Land Mangement, began his remarks by identifying the four most significant laws pertaining to mineral access on Federal lands. The 1872 Mining Law, the 1922 Leasing Act, the 1947 Materials Act and the 1955 Surface Act -- all of which have an impact on mining procedure and second use planning. Deery said that, in a majority of BLM lands, a return to "a natural state" is the most productive second use. Wilderness, wildlife habitat, timber, wild and scenic rivers, and domestic grazing lands are the most common second uses. Here the primary focus is on revegetation and return to natural processes.

In situations where local municipalities might have use of mined land under BLM jurisdiction, however, the Bureau will work closely with the municipality to develop a comprehensive land use plan. Here, said Deery, is a perfect opportunity for a productive second use. The first step is to help the community to understand the concerns that are unique to the Bureau of Land Management. Then it is necessary to explore the potentials of a piece of land and the options available. According to Deery, it is essential for second use proponents to be involved with the land use plan at the earliest possible opportunity. Perhaps equally important is the need for the BLM to involve the public in determining the course of future development on sites near urban centers. This approach would require changing BLM's tradition of requiring that the land revert to open space after mining is over.

The main tenet of the Federal Land Policy Management Act is the conservation of Federal lands. In addition it has provisions for granting long-term leases to low impact uses. It is within the powers of this Act to consider many productive second uses on Bureau of Land Management properties. Deery encouraged the open exploration of such possibilities.

REGINALD REID, Geologist with the Bureau of Land Management in California, used slides to detail several successful projects coordinated by the BLM. Beginning with an overview of Federally held land in California, Reid went on to discuss general climatic conditions that effect mining operations in California. He reviewed mining law and stated that it was the Public Law 167 that gave the BLM jurisdiction over reclamation on Federally owned lands after 1955. He described the requirements set forth in the Federal Land Policy and Management Act of 1976 and their specific effects on California lands, particularly those with special status such as Wilderness Study Areas or Wild and Scenic Rivers. The Act mandates that each area under BLM management have a land use plan with a clear rationale for its administration. Second uses generally tend to reflect the pre-mining use in California, though Reid said it is BLM policy to remain open to new

suggestions. He categorized the BLM's reclamation principles as "the control of runoff and erosion, the re-establishment of vegetation and wildlife habitat, the reduction of visual contrast, and the removal of toxic materials".

Reid pointed to Homestake Mining Company's McLaughlin Project near Lake Berryessa in California as an example of thorough planning that will result in a highly organized and effective project with a complex and specific second use plan. He hopes that this project, developed through the hard work of private industry, public planners and government managers, will provide a model for further cooperation.

Tailings Dam Area, McLaughlin Mine, Homestake Mining Company, Lake County, California, Photo by Ken Cole, Mines and Geology

* **BLAND RICHARDSON**, Research Scientist with the Intermountain Forest and Range Experiment Station in Logan, Utah, for the Surface Mining and Reclamation Project of the U.S. Forest Service, described some of his work in revegetation of mined lands and how those studies enhance potential second uses. He used the video presentation "Reclamation: Before a Single Grain of Dirt is Moved" to show the results of his work and their relationship to problems in reclamation. It detailed the process of exploration of a drilling site in the Bridger-Teton National Forest and listed all of the parameters that must be considered before granting permits, each step of the permit process, and the specific responsibilities of each agency.

The video program highlighted three kinds of reclamation: restoration, rehabilitation, and the establishment of alternative ecosystems. Restoration anticipates the return of the area to the exact, pre-existing plant community. Rehabilitation allows some deviation from the previous ecosystem, if improvement can be shown. Alternative ecosystems allow reclamation to establish a new plant community rather than reflecting the original ecosystem that existed before mining took place. The videotape is available from The Information Group, Intermountain Forestry and

* A copy of a paper on the subject can be obtained from the author by contacting him or her at the address provided in the reference guide at the end of these Proceedings

Range Experiment Station, 507 - 25th Street, Ogden, UT 84401 at (801) 625-5436.

Richardson suggested that reclamation was not, in fact, purely a site-specific matter, but that the process has basic guidelines that must be followed. In Richardson's view, the golden rule of reclamation is "compensate as much as possible for what a site is lacking". This is illustrated by five basic reclamation principles that are the same for all sites and reclamation options. First, immediately stabilize the site by establishing a protective ground cover. Second, ameliorate adverse soil conditions. This includes treating for acidity and infertility. The third principle is to properly prepare the seed bed. Fourth, choose appropriate seed materials and seeding equipment. Fifth, select plant species that will quickly take hold and ease the growth of the plant community desired.

This approach, which condones the use of non-native planting to stabilize the site and then develop the plant community, runs counter to the philosophy of restoration, but according to Richardson, it actually results in better restoration in the long run. Richardson believes that the primary consideration in reclamation should be watershed protection, even at the expense of the local plant communities. However, even with the use of non-native species, regeneration of natural plant growth will happen -- if the original soil conditions can be maintained and improved. Richardson's research into approaches for rehabilitating unique sites expands the potential for successful mining operations on public lands since it enables the site to be protected as soon as possible after operations cease. It also encourages second uses on public lands by increasing the potential to return the land to a suitable condition for wildlife habitat, for grazing and for recreation.

DISCUSSION focused on the steps a private developer might take in proposing and evaluating the potential for success of second uses on Federal land. Although some uses are restricted because of liability problems, it was felt that a developer who brings a strong, well-researched proposal to the attention of the BLM and the Forest Service would certainly have an opportunity to follow it up through agency channels. As they respond more and more to public involvement and comment, the agencies need to become more flexible and open to new ideas and encourage second uses on public lands.

EXPLORING NEW IDEAS

Improving Understanding Through Communication and Education

WORKSHOP PANELISTS

ROBERT MATTHEWS
University of California, Davis

WILLIAM WILLIAMS
Gold Fields Mining Corporation

JAKE RAPER
El Dorado County Community Development

PAULA FINK
National Crushed Stone Association

Improving Understanding Through Communication And Education

Developing successful understanding between the mining industry and the public takes careful communication and purposeful education. Often attempts at better understanding come in the midst of conflict over a project approval and are ineffective. The mining industry has taken on the challenge of educating the public and is working to improve its communication skills. Guidelines for effective education and communication programs are being developed and there are many concrete examples of positive steps taken by the industry in the field of education.

* **BOB MATTHEWS**, Senior Lecturer with the Department of Geology at the University of California at Davis, presented three principal issues he felt were the crux of problems in education and communication. The first was the training of professionals in the field of mitigating land use issues. Matthews pointed out that few institutions have programs for training specialists in land reclamation and rehabilitation. He noted that Harvard University, Utah State University and Montana State University did have successful programs that involved support from private industry. He suggested that more programs be created for professional training in all aspects of mitigating land use issues, especially focusing on public education and communication.

Matthews' second area of concern related to public perception of the mining industry and of the mining process. He stated that those people who have worked with the mining industry or in the environmental movement know how little the public actually knows about mining activities and the real impacts of mining on the environment. Unfortunately, very little information is available to them to clarify or explain the complex processes of mining. The people involved in decision making need to be informed as to the importance of our mineral resources, how those resources are mined and utilized, and how these mined areas can, in fact, be reclaimed or rehabilitated to a safe, environmentally sound and productive state.

Thirdly, Matthews suggested several ways to enhance effective

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communication and education with the general public on issues related to the mining industry. Mining companies should take on the responsibility for informing the general public of the type of activity they propose, the approximate length of time the mining will take, and how they plan to reclaim the area. There are several examples of projects in Europe and the U.S. that could serve as excellent models. A very recent and successful program was used by Homestake Mining in California, where public hearings, field trips, scale models, newspaper articles and other mechanisms were used to disseminate accurate information.

Similar procedures can be used by local government responsible for issuing permits and clearances for initiating a mining program, sometimes working in cooperation with the mining company. Educational institutions, all the way from kindergarten to graduate university programs, could interweave information on local projects, and mining practices in general, into their existing programs. Federal and State governments could publish informational material at all levels and distribute it to schools, organizations and the news media. A report similar to the draft publication "Surface Mined-Land Reclamation Planning and Implementation in California" of the California Division of Mines and Geology is an excellent medium for informing a wide spectrum of organizations and the general public.

If enough individuals, companies, educational institutions and government agencies can focus their efforts on developing effective communication and creating educational programs, Bob Matthews feels a significant change can be made in public perceptions and public support of mining industry projects.

Dagorret Mining Operation, field visit for local Butte County Planning Commissioners, Photo by Ken Cole, Mines and Geology

BILL WILLIAMS, Project Manager for the Shingle Springs Project for the Gold Fields Mining Corporation in El Dorado County, California, described the specific problems encountered by his company in exploring and developing a potential mine site. During the late stage of prospecting at the Big Canyon Site in the resource identification and property acquisition stages, a group of local property owners organized opposition to the project. The property owners efforts included a ballot initiative and appeals to several judicial levels. El Dorado County requires a Special Use Permit for exploration drilling, a policy which is quite different from the exploration drilling "by right" policies of neighboring counties. The Gold Fields Mining Company had no problem in completing the technical aspects of the permit process, but due to a small but committed opposition, the company experienced significant political problems. As a result, it took Gold Fields Mining eleven months to obtain an exploratory drilling permit involving sixty hours of public hearings before the permit was approved, with the result that the costs for the exploratory drilling were inflated to four times the normal.

The problem, as Williams sees it, is that opposition to mining, particularly open pit mining, has intensified in recent years. Frequently, the opposition is not fundamentally concerned with environmental issues, for they realize that most environmental issues can be solved. Their complaints focus rather on the potential degradation of their lifestyle and property values. Williams felt that mineral exploration, with the odds approximately one hundred to one against success, should not be burdened with the costs of a political process of permitting. Rather, he would have government (at appropriate levels), establish reasonable guidelines (including mitigating procedures) for allowing "exploration by right".

Williams believes that government at all levels, and the mining industry, must be involved with the education of the public in the need for, and the importance of, mining. Schools must teach the basics of earth sciences and give the students an appreciation of the source of the minerals and metals that we use.

JAKE RAPER, Principal Planner for El Dorado County, California, shared the perspective of one County on mining and development issues and their relationship to effective communication. Historically, El Dorado County and other neighboring counties had supported the mining industry and its projects in the Sierra Nevada.

In 1975 with the passage of the California Surface Mining and Reclamation Act, counties had to review their permit process and in some cases tighten up regulations relating to mining. In 1979, El Dorado County adopted a Reclamation Ordinance as well as a Mineral Reserve Zone District. The County sees itself

as a controlling agent, there to protect the public health, safety and welfare, and to see that everyone has a fair shot at utilizing their lands under the existing ordinances.

County Planners are now responsible for making sure that the technical aspects involved in the permit process are correct. They are deluged with information by the mining companies in relation to a proposed project, and are expected to synthesize the information into a two or three page report to a Planning Commission or Board of Supervisors so that they may make an intelligent decision on a project. According to Raper, mining projects generate so much public debate that planners must work just that much more effectively and carefully. The California Environmental Quality Act (CEQA) allows the public to ask for any kind of information it desires from the company and the County during the permit process. This guarantees the rights of the public but hampers quick execution of the process. The County must respond to citizen concerns, specifically and fully. Planners in many cases must turn to the mining companies themselves to become educated about the details of the mining process. Planners must then examine how the proposed project relates to the existing land use plans for the area.

In the case of El Dorado County, many new residents have bought five, ten and twenty acre parcels for the specific intent of leading a quiet, rural life. They have come to El Dorado County to escape from urban noise and confusion and consider a mining operation an unwanted neighbor. The County, in creating zoning which allows five acre parcels with agricultural use, has essentially made it very difficult for mining operations to receive permits -- even though the County itself has encouraged mining and sees it as a necessary and beneficial use. Mining companies blame counties, like El Dorado, for not supporting the mining industry.

Raper feels that communication can be improved between counties and mining companies by sharing as much general information as possible -- information that is not necessarily site specific. He recommended several publications from the California Division of Mines and Geology as resources. He mentioned several other handbooks on mining terminology and practices. He supported Gold Fields' attempt to educate the public on the need for minerals through articles in the local newspaper, and described the creation of a Mineral Resources Task Force that was charged with the job of classifying resources and areas, and development of an approach to allow for mining. The Task Force included all of the concerned parties: mining industry, real estate developers, Soil Conservation District personnel, County planners, Forest Service, members of the Board of Supervisors, and citizens-at-large. The Task Force is now trying to sort out the issues involved in developing mineral resources in El Dorado County. Raper feels that this approach will eventually come the closest to meeting the needs of all parties concerned with mining

operations. He also reiterated his view that the public really needs information about mineral resources and mining operations and he suggested the establishment of a publicity campaign, co-sponsored by government and industry, with the idea that "Advertisement might be more effective than education".

PAULA FINK, Director of Public Affairs for the National Crushed Stone Association in Washington, D.C., likened the mining industry to the tomato. The tomato, once thought poisonous, was not eaten in the U.S until recent times. Likewise, the mining industry is often thought of as a dirty, dangerous and nasty creature. This mind-set goes back generations, and to change it will take a concerted effort on the part of the industry. Fink described a film, produced by NCSA, called "ABOUT FACE" which attempts to characterize the "face" that the industry shows to the public and delineates the actual practices used in an open face mine. As NCSA looked for a site to film, they came to the realization that the "face" being shown to the public by the industry is not a positive one at all and that something must be done quickly to improve the situation.

Fink feels one beginning approach is to clarify the language used, such as the use of the word "reclamation". "Reclamation" gives the indication that land was laid waste and must be brought back to life. Most companies are operating mines that in fact are being "reclaimed" at the same time as they are being mined, and by the end of the transitional mining process they are ready for new uses. She showed a new film by NCSA, "CRUSHED STONE: OUR MOST BASIC RESOURCE," which describes the industry to the public. It can be used in public meetings to support specific company proposals, or shown in schools to a variety of age levels. It is also being sold to cable television companies for showing to a wide audience. Fink made it clear that in order to be successful in promoting the mining industry in general, and the aggregate industry specifically, it is important to inform the public long before the public hearing process starts on a project. By then, adversary relationships will have already been established and there will be no climate for education. Companies must address people's fear of a loss of the quality of their life and deal honestly with those concerns before "push comes to shove" in the hearing room.

DISCUSSION centered on sharing resources that could be used to enhance communication and develop educational programs. Geologists and industry representatives in the audience expressed a concern that public attitudes towards mining operations are already so negative that it is almost futile to try

to counter them with education. They suggested cooperative regulation by local, State and Federal government as a way to deal with politically difficult permit processes. On the whole, however, the participants felt that it is possible to develop programs to improve understanding through communication and education and, in fact, most felt that significant steps are being taken in this area.

EXPLORING NEW ALTERNATIVES

Development as a Productive Second Use

WORKSHOP PANELISTS

GENE BLOCK
CONROCK Company

NORMAN GILROY
Norman T. Gilroy & Associates

CATHERINE MUNSON
Lucas Valley Properties, Inc.

Development as a Productive Second Use

By the time mining is complete, many mining properties are ideally located for conversion to residential, commercial or industrial development, fitting neatly into local development patterns that have encircled them and which are part of the very communities their products have helped to build.

Often the highways, service roads, waterways, services and utilities, drainage ways and ponds, and erosion control and screen plantings that have been built, and paid for, by the mining operation can be of significant value in the later development of the site. With proper planning, the mining site can become a real estate property that is actually superior to others in the area. Over the period of the mining operation, the site can be prepared and enhanced, making it a mature development site when mining is over and maximizing its value to both the mining company and the community of which it is a part.

The second use potential of a mining site may be lost, however, if the mining company is not sensitive to the eventual uses and value of its properties. Preparation for developmental second uses requires a kind of long-term creative thinking not often found in mining companies today. Much can be learned from those who have successfully invested their time and energy into this process.

GENE BLOCK, Vice-President and Properties Manager for CONROCK in Los Angeles, described his company as a large, diversified organization capable of carrying out the mining and the development of second uses in-house. His company feels that the best kind of reclamation is found where the final mining is, in fact, the reclamation, and where little more has to be done to create a developable or usable site.

Block began with a discussion of low-intensity uses that might be suitable to a mining site. He cited the Anaheim Lake project in Southern California where mining pits were used as ground water recharge ponds in a "water-poor" region. In that project, the fishing rights associated with the pond proved to also be a valuable asset, grossing nearly $100,000 as it served

the needs of the highly-impacted metropolitan area of Los Angeles. Block also cited the examples of a golf course on mined land on Santiago Creek in San Diego County, and a farmland reclamation project in San Diego County where mined land was returned to a cultivatable state and then leased back to a farmer to operate. Block demonstrated with slides how mining and agriculture can co-exist at very close quarters. He also discussed a site in Central California that was used after mining for a sod farm, a use requiring an area of approximately 100 acres that was otherwise hard to find.

In Irwindale, a CONROCK extraction area is used to house a well screened wood-chip operation and pipe manufacturing plant. Other uses in need of screening are often found in old mining operations -- car wrecker's yards, auto impoundment areas, material storage yards, service yards, etc. Sometimes, however, association with this kind of operation is not a benefit to the mining industry which is trying hard to get away from the image of an unsightly operation that is a poor neighbor to other land uses.

Sanitary landfill operations are a productive second use that is often appropriate to mining sites in heavily populated metropolitan areas. The landfill operation can be a good business in itself, producing a flow of revenues that can enhance the profits of the mining operation year-to-year. The filling process can prepare land for future uses on the surface if methane gas and sediment problems can be avoided or handled. In some high demand situations in Los Angeles, development has actually taken place on the ground surface over former landfill operations, sometimes using pile foundations that extend to solid ground under the fill, or a thick spreader-pad of fill placed on the surface to spread loads evenly and minimize settlement.

Block cited a variety of projects in San Diego, Orange County, and Columbus, Ohio, in which housing, condominium and mobile home park development was found to be a productive second use. He pointed out that many of the operational and construction facilities associated with a mining operation can be used to good effect in later development if they are thought out in advance (roads, services, ponds berms, fencng, terracing, planting and screening, etc.). Block ended by discussing a proposed use for mining property close to Claremont College, where World Vision International has established its headquarters on the old quarry floor surrounded by the high cliffs of the quarrying operation.

* **NORMAN GILROY**, architect and land use planner with Norman T. Gilroy & Associates, discussed two projects on which his company has been working for the past ten or twelve years, providing both initial planning and implementation support to the mining company or the developer of the land.

* A copy of a paper on the subject can be obtained from the author by contacting him or her at the address provided in the reference guide at the end of these Proceedings

At Larkspur Landing in Marin County, the former Hutchinson Quarry and Brickyard has been converted to a mixed use development of offices, housing, commercial development, and a major regional transportation terminal from which ferries transport commuters to San Francisco every day.

Gilroy pointed out that the Larkspur site had become ideally located and was a "one of a kind" waterfront property by the time the lengthy mining process was complete and the opportunity for second use development became available in 1971. The property lies at the intersection of the two major highways that serve the region, and was by that time virtually surrounded by the dense suburban development of one of California's wealthiest communities. Yet when he began work on the property, it had not been positioned for development at all. Developers brought into the project by Gilroy expressed the need for an "anchor" use around which to position other uses on the property. After lengthy competitive negotiations, the Golden Gate Bridge Highway and Transportation District decided to locate its Central Marin Ferry Terminal on the quarry's former truck maintenance site, using the quarry's barge loading channel as access for its three diesel-powered ferries. Once the initial anchor was established, the land value of the property shot up and the door was open to development of the surrounding lands.

Development then proceeded under Lincoln Property's guidance in a series of carefully planned phases. Each was accompanied by a corresponding definable rise in the value of the land. A Master Plan and Reclamation Plan was prepared, and it ultimately was approved by the local City and incorporated into their long-term General Plans for the area as they annexed the property. Subdivision was the next step, and it was accompanied by the establishment of an Assessment District whch used public bond funds to install the necessary internal streets and services, making each sub-parcel a self-contained, saleable entity. Under the Master Plan, each parcel had a designated single purpose use (commercial, office, residential, hotel, etc.) making it easier to attract the kind of "single-use" developers often found in suburban communities.

A second anchor was then negotiated in the form of a theme shopping center developed by W.R. Grace Company (the shopping center itself had an internal anchor in the form of a prestigious grocery store operator which became the major tenant for a corner site). Lincoln Properties then developed the office complex in three phases and the housing complex, with the land values rising dramatically as each phase was begun or completed.

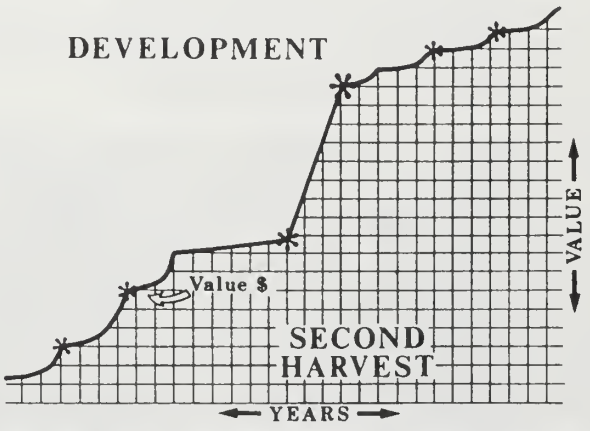
Over a period of seven years, with careful management and attention to market conditions and the planning requirements of local agencies, the value of the land at Larkspur Landing has risen in increments from $2 per square foot, to $9 per square foot, and now to almost $18 per square foot (based upon actual

sales of parcels within the development). Though this may be a somewhat unusual case, due to its location in a very wealthy and expanding real estate market, Gilroy said use of the same principles and controlled phasing process can produce similar success in other developments, depending upon the scale of the local real estate market and local property values.

The principle was applied by Gilroy's organization at McNears Quarry in Marin County, property on which Gilroy has worked as a consultant since 1972. There, the long-term Mining Plan for the property has been coordinated with a simultaneous Reclamation Plan and Second Use Plan. Geologic investigations associated with the planning process actually helped the company to locate an additional five-year supply of high quality rock which lay under a ridge which had been thought to be already "worked-out". The ridge is now being terraced, removing marketable rock from an advantageous uphill location above the processing plant, while the deep quarrying continues in the 50-acre central pit which will eventually extend to 200 feet below the level of adjacent San Francisco Bay. Basalt Rock has used the extended time period inherent in the mining operation very effectively to "plug into" the local General Planning and Neighborhood Planning processes and providing a natural forum to discuss its mining and long-range plans with local neighbors. Improving day-to-day working relationships and turning the hearing process, which started with a gathering of almost 200 "concerned local citizens", into a much more comfortable relationship where the final approval hearing was attended by only one representative of the local Homeowners Association, there to "make sure that no last minute changes were made".

Gilroy's firm has advised Basalt on management processes at the McNears Quarry which will provide them with the opportunity to participate in, or control altogether, the rising land values which will result from mining and reclamation activity over the next 10 to 15 years. The first major rise in value probably occurred when the Reclamation/Master Plan was approved. Another significant rise took place when zoning and General Plan adoption occurred. In the future, significant financial milestones will occur when terracing on the central ridge is completed, when the quarry bowl is deepened throughout its entire area to a point where a harbor could be constructed by flooding it and connecting it with San Francisco Bay. Further value increases will occur when various portions of the site reach "development readiness" as a result of Basalt's shaping and enhancing process and when subdivision occurs and roads and services are bonded or installed. Basalt continues to keep a careful eye on the public development of downstream road, sewer and water supply improvements which could facilitate or limit future uses on the property and monitors changes in planning policy in the local community that might affect the ultimate use of their property.

In recent times, the potential value of the property as a future development site has played an important part in an analysis of the value of the mining company as a whole -- another area where Gilroy feels that second use potential can be an important and valuable factor.



Larkspur Landing, quarry with residential and commercial development, Marin County, California, Photo and Chart on this page illustrating periods of value increase, by Norman T. Gilroy and Associates

CATHERINE MUNSON, President of Lucas Valley Properties, Inc. a real estate brokerage in Marin County, California spoke from her point of view as a broker, investor, developer, and owner of land. She stressed that it is quite possible for mining companies to plan, and prepare for, second uses, even if the precise second use that is likely to be allowed a decade or two in the future is not certain.

There are a number of basic principles which apply to land development that would make a piece of land "market ready" for a range of second uses, leaving precise selection to a point later in the process. Land use developers are experienced with such things and many would welcome the opportunity to provide their expertise to mining companies, perhaps taking a "right of first refusal" to participate in the development when mining is complete.

She suggested that the mining company might grade the land so that areas of instability are eliminated and "development planes" are created (perhaps terraced to take maximum advantage of views, climatic setting, etc.) Setbacks might be planted early, providing screening and erosion control and serving as the foundation for mature vegetation that later enhances the appearance of the land and, therefore, its real estate value. Frequently a mining site begins as a rural property, but by the time that second use development is appropriate it is surrounded by an urban area where good property is "hard to find".

Munson suggested that all sorts of unusual uses might be applied to mining properties -- museums, corporate headquarters, document storage facilities, etc. The idea of creating a mining museum out of a mining operation is a very interesting one, as are other public service uses such as a zoo, a horticultural park, a theme park, marina, or offices and medical facilities about which conferees had heard earlier. Munson suggested that a number of kinds of housing use are available as second uses and that there is much potential in the idea of mixing types of housing on a site. She stressed the need to be creative about integrating uses together, and suggested the idea of combining uses, e.g., a golf course surrounded by research and development.

In a normal development project, Munson said, a preliminary development analysis is done years before the development itself takes place. Many real estate developments take up to four years to move from the initial planning phase to the point where construction can take place, all of which time could be overlapped with the final stages of the mining process. Continuous contact with the local community avoids animosity and opens up the door to opportunities as the community begins to feel a part of the planning process. It is clear that market demographics change constantly, and any long range plan must be designed to be flexible and adaptive to change. Careful planning can, however, ensure that the land will still be very usable no matter how demographics and politics change.

DISCUSSION focused first on the difficulty that most small or medium sized developers experience in finding "up front money" for projects. Usually the solution involves a financial association with individual investors and small investment companies, most of whom look for an early return on their money. Most mining projects occur over an extensive period of time, and it is difficult to reconcile the long term expectations of the mining company and the relative short term return-on-investment needs of the investor. Mechanisms can be worked out, but they require ingenuity and an understanding of the needs of both the mining company and the developer.

It was suggested that large institutional companies might be a source of front-end money (pension plans, unions, large insurance companies, etc.), since many of them take a long range view of their investments and like to create some demonstrated benefit to the community at large through their investments. It was also suggested that the Federal Government might take a more active role in investment in this kind of long term opportunity. Funds, which are not earmarked for short term spending, are invested over the long term as part of the government's way of doing business.

It was suggested that, in an ideal mining operation, the value of the land is growing, not declining, as the land and its landscape matures throughout the mining process. Opportunities exist for partnerships between mining companies and developers in which both share the increased profit over time. An early association can help to "pilot" the project through various stages of planning and approvals, as the mining process progresses maximizing land values at each stage and offsetting the costs of reclamation as they occur.

A number of speakers expressed their feelings that it is important that the mining company and the developer involve the public in their planning process and not work in secret. Public hearings are difficult places to find accepting audiences, since most hearings are conducted on an adversary basis and informal meetings with working committees are a much better forum in which to exchange ideas and avoid confrontations.

It was suggested that mining companies look carefully at how they control their land from the very beginning. Even though it is common practice to lease land (thereby minimizing their initial cash investment), purchasing the land provides much better control and more certainty of significant participation in the ultimate end profit from second uses.

One speaker suggested that government should take a more flexible attitude, thinking of itself as much as a provider of incentives as a regulator, and using mechanisms such as enterprise zones, development agreements, etc. to create additional incentive. Even though a mining company might be required by law to reclaim its property no matter what, the incentive is to do as little as possible if the company cannot participate in the benefits or profits generated by its reclamation or if it cannot have reasonable certainty about both the future uses that will be allowed on the property and about their ability to continue the mining activity over the long term. Local agencies frequently have an inflexible concept of the future use of a piece of property, and it is only by working closely with the planning agency that a variety of uses can be hammered out.

Munson encouraged mining companies to use their time to advantage. Public sentiment can swing widely from "no

growth" to "growth oriented" and a company needs to be alert to opportunities to implement portions of its plan or to make sure that roads and services are installed to facilitate their long range development plans. On the other hand, there is a danger to being too specific at the wrong time, and patience is often needed to wait until the political climate is most accepting of the second use plan proposed by the mining company. Flexibility needs to be built in to enable the plan to adapt to a changing financial, political and physical opportunities and restraints.

Munson cautioned mining operators to be aware that "as soon as you start working with a co-developer, you start to operate at high risk and there is a need for extreme caution about who you work with". A prudent approach to making and nurturing partnership relationships can, however, result in significant profits for both the mining company and the developer, and in compatible development and even economic benefits for the local community.

EXPLORING NEW ALTERNATIVES

Agriculture and Forestry as Productive Second Uses

WORKSHOP PANELISTS

SARAH LOWE
TCG Materials Limited

STUART MC RAE
Wye College, University of London

THOR BAILEY
Energy Production

WALTER DAVIDSON
USDA Forest Service

Agriculture and Forestry as Productive Second Uses

Agriculture and forestry are both potentially productive second uses of mined lands that represent potentially profitable opportunities for the mining companies, and an acceptable and productive land use for the communities in which the mining project is located. Agriculture established as a productive second use can have the effect of replacing once valuable crop land affected by the mining process, and the promise of it can be a viable tool in the bargaining process for new extraction areas. Forestry, once the mainstay of the American reclamation procedure, is a valuable second use that produces a cash crop often ignored by current approaches and regulations. Together, agriculture and forestry expand the significant options available to the mining operator in planning and executing productive second uses, particularly in rural areas.

Grace Ranch, Basalt Rock Company, Sonoma County, California, return to agricultural use, Photo by Zoe Mankoski, Mines and Geology

* **SARAH LOWE**, Supervisor of Rehabilitation and Property Improvement for TCG Materials, Ltd., of Brantford, Ontario, Canada, presented her company's experience with agriculture as a second use of reclaimed land. TCG operates in the south-central Niagara region of Ontario, an area known for its tender fruit harvest. The tender fruit orchards are unique in Canada, and are of great value to the region and to Canada's general agricultural production. Yet, underlying many of the orchards are sand and gravel deposits of high commercial production quality. TCG has taken on the challenge of learning how to return the mined areas to productive orchards within a

* A copy of a paper on the subject can be obtained from the author by contacting him or her at the address provided in the reference guide at the end of these Proceedings

relatively short period of time -- no easy feat.

According to Ms. Lowe, major problems confront TCG at each stage of the reclamation process. The first comes in the planning stage, when special storage plans must be developed to maximize the saving of critical top soil. Without special consideration for site planning, killing frosts will ruin the chances for a strong harvest. There must be a free flow of air around the site -- no pockets to trap cold, damp air. During the mining process, sedimentation ponds must be carefully silted and handled. If the future orchard is too wet, the trees will die in early spring from "wet feet". All of these aspects must be balanced in relation to the special conditions found at each quarry or pit site.

Once the mining operation has ceased and the topsoil has been returned to the site, TCG faces its foremost challenge -- learning to be farmers. Through hard earned experience, the company has developed an agricultural cycle that optimizes production of the future orchards. By not rushing straight into planting an orchard, TCG slows the return on its investment, but at the same time invests in the fertility of the land by developing nitrogen rich, renewed topsoil. A year, or even two, of hay or alfalfa production prepares the soil for its upcoming work. When the ground is ready, an orchard is planted, and once again TCG shows its patience, for it may be five years before a crop is produced and even longer until a full harvest.

Waiting six years for their new orchard to pay off in cherries and then watching another four years or more during the payback period that compensates for the reclamation costs may seem like an unreasonable risk and effort on the part of a mining company in exchange for the right to extract sand and gravel from a rural, agricultural site. However, in the case of TCG, it is seen as just good business practice. In order to open valuable orchard areas to sand and gravel mining operations, TCG has shown its willingness to re-create orchards of equal value and production. This can win for them the support and understanding of the communities within which they must work and, at the same time, promise them a future in mining in the unique Niagara region.

Cherry Harvesting, Ontario Canada, tender fruit region of Ontario, Photo submitted by Sarah Lowe

* **STUART McRAE**, a lecturer at Wye College, University of London, and consultant to industry in agricultural reclamation, identified the English approach to agriculture as a "siege mentality" -- self-sufficiency in agriculture must be maintained at all costs. This attitude, though self-serving for the farmer and the consumer, places the mine operator in a difficult position. It often seems the expectation is that the mining company must leave the land in better condition than it found it. Given the often marginal quality of some agricultural land, this can be a difficult task.

Dr. McRae's approach echoed TCG's in certain ways. He sees initial planning as the key to the development of the specific project. This planning involves detailing the approach all the way through the second use phase. He recommends "progressive restoration" so that a local community can see the actual second use developing as the first use continues. That approach allays the fears of those who see the mine operator as an unfriendly and unwilling neighbor.

Designing the final landform is an essential pre-planning step that ensures a successful project. Preparing for second use drainage problems as part of the initial mining operation saves expensive and time consuming retrofitting of drainage systems. Separate stripping of topsoil and subsoils, along with careful storage of soil materials, allows for the return of materials in the correct sequence and balance. Dr. McRae believes that it is important to be careful to avoid soil compaction, even to the point of using special soil removal and replacement equipment.

Even when the optimum conditions are present, a mining operation returned to agriculture may face real difficulties in becoming productive. In projects in England where the mining site is used for a landfill project before conversion to an agricultural use, the production of methane gas is a major problem. The gas may seep into neighboring fields, hedgerows and even basements. By British law, the mine operator is legally obliged to provide after-care for at least five years and must bring back the property to a "state of fertility". It is that "state of fertility" problem that concerns Dr. McRae the most. Fertility is defined by the relationship of chemicals present in the soil compounds, and the balance of chemicals is measured by government officials in charge of agriculture. McRae believes, however, that fertility should be measured by the production capabilities of a piece of land, and not by its chemical composition. He feels it would be a far more reasonable test of a soil's potential health.

While Ms. Lowe made a case for TCG regarding the financial success of agriculture as a productive second use, Dr. McRae saw the reclamation of mined land to agricultural production as a "ticket to opening more areas for mining". The investment is made by the mine operator primarily in order to create a trade-off of refurbished and redesigned crop land for other unmined agricultural land. Although on the surface it may seem

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an uneven trade, the growing expertise of the mining industry in developing productive agricultural land makes the process a more reasonable one that meets the needs of the mine operator, the farmer and the community.

THOR BAILEY, of Energy Production in Chico, California, feels that fuelwood farms and biomass energy production offers an opportunity for a productive second use that combines both forestry and agriculture. Eucalyptus plantations can be developed for use as part of a wood fuel plant, sold as cord wood, or used as wood pulp in a variety of products. The eucalyptus is a hardy tree that grows well on marginal land, needs little water and is temperature tolerant. A fast growing tree, eucalyptus can be ready to harvest for several purposes within three years. With the addition of irrigation early in the tree's growth cycle, the speed of growth can be greatly increased. Though there have only been a few experiments to demonstrate its potential, the possibility of eucalyptus providing a cash crop on reclaimed land seems strong. Mining operators might benefit from the expertise of specialists like Thor Bailey and design their mining and reclamation projects with biomass energy production in mind. In areas where mined land is of marginal quality and a return to intensive agriculture is unnecessary or not feasible, biomass energy production may well be a very profitable second use.

* **WALTER DAVIDSON**, Research Forester with the Northeastern Forest Experiment Station of the U.S. Department of Agriculture Forest Service in Princeton, West Virginia, continued to focus on reforestation as a potential second use, citing its many benefits. Reforestation was once the primary after-use of mined land in the United States. Vast tracts of land were mined for sand and gravel, coal and other minerals. They were then revegetated with trees of many different varieties, depending on the climate and the needs of the logging industry.

Some reforestation was done to produce new wildlife habitat, but it seems the most important result was to hide the ugly scars and provide a financially productive second use. However, in many areas, erosion takes place where trees were the only source of cover. To counteract this problem, new laws were passed that demanded a high percentage of herbaceous cover. These laws limited the planting of trees indirectly, for the mine operator could more easily meet regulation by planting some kind of ground cover. Once-active mining areas ceased to be shrouded in woodland, but rather resembled the rolling green hills of the Midwest.

Davidson feels the new laws have led to a reduction in the potential uses of mined lands, not only as logging areas but also

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as conservation districts and wildlife habitats. Limiting the type of cover available to use in reclamation, has reduced the diversity of habitats and the multiplicity of uses once available from reforested lands. He recommends that the laws be changed to allow for more flexibility in the reclamation process, and to encourage the diversity necessary for successful environmental management. He would rather see stronger guidelines on the planning process and closer evaluation of individual objectives in place of mandatory requirements that may not fit site specific needs.

Davidson pointed out that reforestation requires less grading and leveling on the site, thus reducing operator costs and minimizing compaction problems. A hill and valley topography is often a preferred outcome in a wooded area. Davidson feels that we must make tree planting as economically feasible as it once was in order to fully utilize the potentials of reclaimed lands.

DISCUSSION confirmed that agriculture and forestry remain two strategically productive second uses of mined land, particularly in rural areas. They are uses integral to the newly emerging philosophy of the mining process and its relationship to land use planning. No longer is mining seen as an end in itself, but rather as one essential and integrated part of a land use process that may move from open space to rural agriculture to mine operation, and then on to a variety of productive second uses, then third uses, and so on. As our technical skills develop and our communication skills improve, choosing the most viable after-uses for a mining property will become a necessary and valuable goal for all involved.

Reforestation, Grefco Mining Company, Shasta County, California, Photo by Lorraine Van Kekerix, Mines and Geology

EXPLORING NEW ALTERNATIVES

Recreation and Tourism as Productive Second Uses

WORKSHOP PANELISTS

CHRIS STUART
Oakwood Lake Resort

THOMAS FORD
National Park Service

LORRAINE VAN KEKERIX
Division of Mines and Geology

ZOE MANKOSKI
Division of Mines and Geology

Recreation and Tourism as Productive Second Uses

Frequently a mining site has unique qualities of access, location or terrain which make it most appropriate for recreation or tourist activities after extraction is complete. Lakes and inlets created by sand and gravel operations have been adapted to yacht harbors, beach parks, fishing ponds, sailing ponds, watersports centers or wildlife habitat. Spoil piles have been re-shaped for sports arenas, year-round ski runs, skating rinks, playgrounds, concert sites, campgrounds and water slides that attract people from all over. Sometimes the buildings and workings of the mining activity are attractive to visitors interested in history or industrial operations. The possibilities of recreation and tourism as second uses for mining sites are as varied as the sites themselves.

Oakwood Lake Resort, Manteca, California, diversified recreational facility on site of an active sand operation, Photo submitted by Oakwood Lake Resort

CHRIS STUART, General Manager of Oakwood Lake Resort in Manteca, California, described the creation of the resort which was developed on his company's property in conjunction with an active sand mining operation. Oakwood Lake Resort was conceived by owners Robert "Budge" and Arlene Brown of Brown Enterprises, a Manteca-based company. There are now three divisions: Brown Sand, Inc., a processor of sands; Oakwood Lake, Inc., a resort and recreation park company; and Hydroglass Systems Ltd., designers, manufacturers and marketers of waterslides and rapids rides. As President, Budge Brown presides over a family-run business which has doubled in size since its inception.

In the early 60's, farming -- which was the primary use of the land that Oakwood Lake and Brown Sand are situated on -- was a very difficult occupation. The owners looked around for other income sources and discovered a big need for fill material to help build freeways in the Manteca-Stockton area. Brown Sand, Inc., was formed to supply the needed material for the construction of Interstate 5, and as the sand was excavated and sold, a large pit formed. Considerable thought was given to the reclamation of the area where the excavation was taking place.

It was at this time that the owners became aware of the need for a unique recreation area to serve their region. Coupled with this thought and the idea that the large pit which had begun filling with water from artesian springs located on the property might be a valuable resource, plans were developed for a recreation-vehicle park. The owners began thinking of ways to draw people to their park, and after a trip to Hawaii where they saw a number of beautiful, natural waterslides, they began to design the first waterslide installation on the West Coast. As the lake continued to grow in size and the campground was developed, the park grew in popularity among both younger and older patrons.

It was at this point that Brown Sand and Oakwood Lake began to work in coordination with each other. As new areas of Oakwood Lake were planned, the sand market was researched and new processing plants were opened to meet the growing need for dried sand products. As the sand was excavated, land reclamation for the Oakwood Lake project worked hand-in-hand to create new and exciting rides and facilities at the park. The lake continues to grow at a rate of five acres a year. During the winter months the level of the lake is pumped down, allowing sand removal in specific areas. The sand is processed in one of the three plants, stockpiled or sold. In April of each year, after the lake has been re-shaped and sand removal has been completed, the water is allowed to return to the right level for recreational uses.

Now, Stuart said, after eleven years of development, the once large open pit of Brown Sand is one of the most beautiful recreation parks in California. People come from all over the

world to enjoy the camping, the waterslides and other rides, and to listen to top billed entertainers performing at Oakwood's newly constructed 6,000-person capacity outdoor amphitheater. Eventually, Oakwood Lake will encompass the total sand operation area, and will include restaurants, a hotel, a small railroad system, gas station, and many new and exciting facilities for entertainment. In this case, recreation has clearly provided a unique and profitable second use.

THOMAS FORD, Environmental Specialist from Death Valley National Monument of the U.S. National Park Service, discussed the challenges inherent in reclaiming mined land in an area which is not only a popular recreation and tourism site, but is also a harsh and demanding desert environment. Death Valley National Monument is one of the few units in the National Park System that contains active mining operations. Although the "Mining in the Parks Act" of 1976 closed off the Monument to new claims, previously held claims have been allowed to continue.

The Park Service has responsibility to require and review plans for new operations to ensure that: 1) any mining and related activity approved is confined to valid and patented claims; 2) the approved plan complies with regulations; 3) damage to natural and cultural resources is the minimum consistent with the owner's rights; 4) approved plans are adhered to; and 5) appropriate reclamation is included in the approved plan.

Most claims and active mining operations in the Monument are for talc and the borate minerals -- colemanite and ulexite/probertite. Both open pit and underground mining methods are used to recover the commodities. The Park Service is primarily concerned with the impact of these operations on the Monument's aesthetic, cultural and natural resources. The Park Service is constrained in reclamation strategies by several factors. The overriding limitation is that the only acceptable second use is recreation compatible with a natural area, usually including hiking, natural vistas and scientific study. Unacceptable reclamation would include revegetation with non-native plants, major new surface disturbance resulting in topographic alteration whether the site is obliterated or not, commercial uses, and incompatible recreation. According to Ford, the primary reclamation objectives of the Monument are to restore the natural surface configuration of the land and the pre-existent ecological processes.

Experience in Death Valley has shown that angular configurations which contrast visually with the surrounding undisturbed topography result in high visual impacts and make the site identifiable from a great distance as a man-caused feature. Reclamation plans must, therefore, have as elements:

resloping or regrading of waste dumps; reducing slope banks, cuts and pit walls; and, in some cases, backfilling of pits. Further reduction of the visual impact of a mining operation is gained by veneering dumps and pads with overburden stockpiled during stripping and surface facility construction. In some cases, this has been done concurrent with operations; in others, after mining has terminated. Veneering has been particularly successful in both underground and surface talc operations where the white talcous waste or exposed beds contrast sharply with the dark desert varnished or basaltic surfaces. A notable example of successful reclamation is the open pit Bonny Mine, which in 1976 could be seen from major visitor interest points up to 40 miles away on both sides of the south end of Death Valley. After the spoils piles had been veneered with diabase to match the surrounding surface, the mine is today inconspicuous except at close range.

The regrading, backfilling and veneering processes contribute to the success of establishing natural revegetation -- an important factor in view of the Park Service's policies that prohibit introduction of exotic species, especially those obtained from commercial nurseries. Experience indicates that replacement of, or veneering with, alluvial gravels provides a natural seed source and suitable substrate for revegetation. Properly graded and veneered dumps have exhibited revegetation in local diversity and density within six years.

Serious problems affecting the ecosystem or natural environment of a site are normally dealt with, and resolved, before a plan is approved. Dumping and staging areas are often positioned to avoid blocking drainages or to preserve habitat, especially for plants under the protection of the Endangered Species Act. The small size of most Death Valley operations limits the area of impact (except the visibility of the operation), and to date animal populations have not been adversely affected. Because of the careful monitoring of mining operations by the Park Service and the development of specialized reclamation processes, Death Valley's unique scenery and delicate desert environment is being saved for continued recreational use and scientific study.

* **LORRAINE VAN KEKERIX** and ***ZOE MANKOSKI**, from the Reclamation Program of the California Division of Mines and Geology, showed slides of the Holme-Pierrepont National Watersports Center in a gravel extraction area near Nottingham, England; Big Pit, a deep shaft coal mine in Wales that is now a tourist and historic center; and Butchart Gardens, a world-famous horticultural attraction in a quarry in British Columbia, Canada.

* A copy of a paper on the subject can be obtained from the author by contacting him or her at the address provided in the reference guide at the end of these Proceedings

The Holme-Pierrepont National Watersports Center resulted from the conversion and shaping of a string of gravel extraction areas. It now is used as an Olympic training center for

watersports, and it is also the site of a wide variety of recreational activities, from windsurfing to sailing to hot air ballooning to show jumping. The cost of maintaining the Watersports Center is borne in part by the visitors, fishermen, campers and sports enthusiasts who use it, and in part by the government.

The Big Pit Mining Museum draws visitors from all over England and Europe and reflects deep shaft coal mining operations as they existed fifty to one hundred years ago. Butchart Gardens, in Victoria, B.C. and Elizabeth Park in Vancouver, on the other hand, are transformations of huge quarries into stunning gardens, with ponds and waterfalls, colorful trees and constantly changing flower displays. Each of these projects show the potentials available in the reclamation process and the importance of recreation and tourism as productive second uses.

Butchart Gardens, Victoria, British Columbia, Photo by Zoe Mankoski, Mines and Geology

DISCUSSION focused on a sharing of ideas and experiences of other possible recreational uses of mined land. Cross-country courses for motorcycles and four-wheel-drive vehicles was one option mentioned, though conflict with neighbors seems to be common in this kind of use. Water based parks, like Oakwood, were thought to have tremendous potential, especially with the developing interest in waterslides and wave generating machines. It was clear that access to water was an important aspect of reclamation.

The difficulties faced in rehabilitating land in delicate areas like Death Valley was discussed at length, as was the role of Federal agencies like the Bureau of Land Management in supporting recreational second uses. One specific suggestion

in relation to Federal land was the creation of wildlife refuges. Peregrine falcons could use old quarries as nesting sites and bald eagles could establish colonies on tailing mounds.

Conferees stressed the necessity for keeping a close watch on the water quality of any project developed for recreation, underlining the need for an ongoing process of management that does not end with the development of an area. Sometimes, in States like California where water is in short supply, the potential for water based recreation is limited, though at the same time the demand for such facilities is even greater.

Under the Recreation and Public Purpose Act, public lands under BLM or Forest Service jurisdiction can be transferred to county control. This requires a formal land-use classification, backed up by a decision within the land-use plan to permit a title transfer. The county must also have a development plan which could be simply "open space", but preferably one which intends some kind of developed recreation.

The Act further requires that the development plan be designed and executed within 10 to 12 years, a constraint which, given the limited resources of many counties, inhibits them from taking advantage of this opportunity.

All in all, participants felt that experiments are underway that could create new options for productive second uses through recreation and tourism, and that the potential of reclamation uses is only limited by the creativity and technology of the land owner or his associates.

EXPLORING NEW ALTERNATIVES

Reclamation As Art

WORKSHOP PANELISTS

CHERIE KLUESING
Harvard University

TIMOTHY COLLINS
United Mining Corporation

STEVE COSTA
Bay Area Partnership

PAUL KLITE
Sculptor

Reclamation as Art

For centuries, the dramatic land forms and lakes of worked out quarries have been a challenge to sculptors, gardeners and artists. With creative ideas, mining sites can become sculptural landscapes that are valuable cultural amenities and open space for the future. Reclaiming mined sites as art provides opportunities for developing new, wholly-imagined environments built on the features of the mined land. The landscapes that result can be temporary or permanent. In order to meet this unique challenge, miners and artists must work together with art councils and funding agencies to explore the creative possibilities available.

Art-sculpture proposal, (c) Paul Klite, artist

* **CHERIE KLUESING** is an Assistant Professor of Landscape Architecture at Harvard University's Graduate School of Design and a partner in the Walker Design Group of Belmont, Mass. She discussed her research under the title "The Pleasure of Redeeming Landscape: Creative Experiments in the Second Use of Mined Land".

Kluesing described her purpose as "to focus on a single type of landscape experiment -- the redemption of land through art and design. Many of us, who are interested in land reclamation, know the pleasure of redeeming landscape and following the tradition of land-use that has been one of constant use and re-use of land."

* A copy of a paper on the subject can be obtained from the author by contacting him or her at the address provided in the reference guide at the end of these Proceedings

"For the purpose of this discussion, two generic approaches to reclamation were presented as a slide review, looking first at the reformed wasteland park and then the new art landscapes. Both categories attempt to "redeem that which has been neglected" (J.B.Jackson), with the primary second-use activity being creation of a new landscape. The first, tends toward the garden tradition, attempting to disguise the effect of mining. The latter tends toward revealing bits or fragments of information about the past life of the site, as well as creating a new experience. The second-use strategies could generally be described as efforts to either cloak the land in a garden park or to uncover past information by revealing or peeling back the site through art."

"The challenge that presents itself today", said Kluesing, "is to generate a deeper discussion about the pleasure of redeeming landscape ruins through art. For those of us who are interested in problems of landscape and art it is imperative that we focus on the creative challenge of developing landscapes that expand our knowledge and understanding of the world we live in. We must recall that every society is involved in the perpetual care, use and reuse of land.

"Through the civic arts, design and the fine arts, we have the possibility of focusing attention on a variety of basic questions. The arts can help create imaginative environments for us to retreat to. The arts also allow us to see and grasp images that have never before been imagined. Places such as Butte Chaumont, Opus 40, Broken Circle/Spiral Hill, Johnson Pit #30, and Mill Creek Canyon Earthwork are all testimonies to the power of human imagination and to the creative possibility inherent in the difficult problem of land reclamation."

TIMOTHY COLLINS, a mining executive from Virginia City, Nevada, described his interest in engaging artists in reclamation projects. Collins cited several factors which tended to discourage corporate sponsorship of artistic reclamation in the hope that these could be removed as obstacles. "Companies," said Collins, "are fearful of being embarrassed by a project. To interest corporate managers, you must reduce their risks and anxieties."

He also stressed the importance of working with the community and soliciting their input. He suggested that one way to maximize community involvement and minimize the risk of embarrassment is to commission both a world-class artist who will attract positive publicity to the project and a local artist who will be sympathetic to community interests. Corporate anxiety can be further reduced, said Collins, by opting for jury selection of the project and deferring to public process.

While corporations are often wary of high-profile projects, Collins suggested they might also provide some advantages.

Such projects often bring publicity to low-profile communities, as well as increase the resale value of the land. Plus, he added, undertaking an artistic project also supplies "artistic by-products" -- drawings and renderings which are excellent for corporate decor and often worthy of museums.

STEVE COSTA, of the Bay Area Partnership, an organization which specializes in assisting local agencies with funding for arts and amenity projects that produce high social and aesthetic benefits, spoke to the issue of reclaiming urban and mined land to parks. He described an International Sculpture Conference convened for the purpose of showing the economic viability of a large sculpture park near Lake Merritt in Oakland. Costa put the emphasis on public and private collaboration which focuses on innovation, documentation and communication as the keys to successful project completion.

PAUL KLITE, a sculptor and contractor to the State of Colorado, discussed his role in the creation of a State-funded program to promote aesthetic solutions to mining reclamation. Through its Mined Land Reclamation Division and the Colorado Council on the Arts and Humanities, the State of Colorado has begun to address the potential of environmental art as a way to enhance -- rather than disguise -- mined landscapes. Noting that government involvement in arts programs is increasing, he suggested that the "percent for art" ethic could also be applied to reclamation works. According to Klite, plans for such a program are now in the formative stage, with the goal of appropriating a portion of the State's mined land reclamation budget to commission the aesthetic/artistic reclamation of specific mining sites.

Copies of Klite's final report will be available through the Colorado Council on the Arts and Humanities.

DISCUSSION centered on three key issues. Firstly, success in convincing lead agencies of the viability of this kind of project is directly predicated on the ability of the proposal to involve local communities in the design stages of a project. It is important to develop a public process that helps define the aesthetic requirements of the project and reduces fear of the outcome.

A second issue is economic -- who is to pay for the actual project? Here the State of Colorado's new program leads the way. Certainly the mining company, which has some burden of reclamation cost anyway, will be a crucial part of the financing of an aesthetic/artistic project. Communities and corporations

who serve to benefit by the work may also carry some responsibility in the funding process.

Thirdly, participants underscored the need for dialogue and exchange in creating new possibilities, and hoped that it would be possible to resuscitate the idea of civic art and its special contributions to landscape.

SHOWCASING SUCCESS

Four Views of Government's Role in the Reclamation Process

WORKSHOP PANELISTS

ZOE MANKOSKI
California Department of Conservation

JOHN MASHAM
Ministry of Natural Resources
Province of Ontario, Canada

ROBERT ANDERSON
Bureau of Land Management
US Department of the Interior

PAUL LAWSON
Department of Geology & Mineral Industries
State of Oregon

Four Views of Government's Role in the Reclamation Process

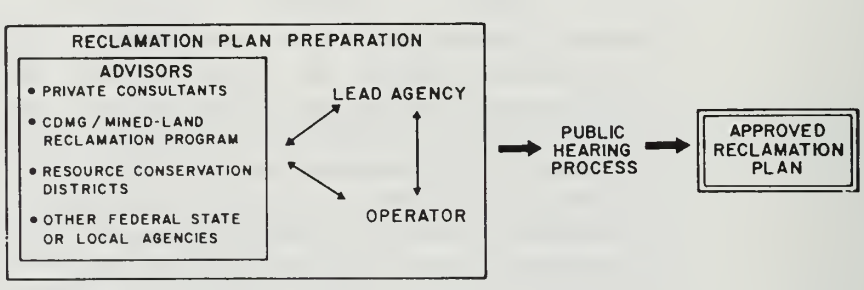
Most European countries, Canadian provinces, the U.S. Federal Government and U.S. States, regulate the mining and reclamation process on mined lands. Many governments are also integrally involved in the reclamation planning process as a stimulator of new ideas and research. Some have become major sources of information on new and innovative approaches to reclamation planning, or have instituted and funded programs to reclaim abandoned mining sites. It is useful and informative to compare how different jurisdictions fulfill their functions, and how each produces positive results on the ground at the point where using and reclamation is taking place.

* **ZOE MANKOSKI**, Manager of California's Mined-Land Reclamation Program, described California's program, which is administered under authority provided by the California Surface Mining and Reclamation Act of 1975 (SMARA), as amended by the Legislature in 1980. The intent of SMARA is: to prevent or minimize adverse environmental effects and reclaim mined lands to a useable condition; to encourage the production and conservation of minerals; and to provide for public safety. Authority for administration of SMARA is vested in "local lead agencies" (cities and counties), and the State provides technical advice on reclamation and is responsible for classification and designation of mineral resources throughout the State and other review and regulatory articles identified in the law.

Ms. Mankoski pointed out that the reclamation planning process in California is complex because of the physical and political diversity of the State. She showed slides of projects from all over California, including U.S. Borax's open pit mine in Kern County; Conrock's Bradley Avenue Pit, a sand and gravel operation in Los Angeles; Natividad's dolomite quarry in Monterey County; Basalt Rock Company's McNears Quarry in Marin County; and the Spanish Mine, a barite deposit in Nevada County, among others. Actual reclamation planning and implementation in California is achieved through a cooperative approach involving the mine operator, the California Department of Conservation and its Division of Mines and Geology, and approximately 90 cities and counties which are designated as lead agencies under SMARA.

* A copy of a paper on the subject can be obtained from the author by contacting him or her at the address provided in the reference guide at the end of these Proceedings

Reclamation plans are first prepared by the mine operator and/or their consultants. Assistance is available from a number of public and private advisors, including the California Department of Conservation. The operator then submits the completed Reclamation Plan to the respective local government (lead agency), which holds public hearings on the Plan. Often in California this process is coordinated with, and runs parallel to, the environmental impact assessment process required under the California Environmental Quality Act.



Reclamation Planning Process - graphic, Zoe Mankoski, Mines and Geology

The State of California's Reclamation Program, established in 1981 within the Department of Conservation, provides assistance in returning mined lands to a useable condition. Mineral classification and conservation are achieved through the Department's City and Country Mineral Land Classification Programs and the State Mining and Geology Board's Mineral Lands Designation activity.

The Reclamation Program's four-person staff provides technical advisory assistance in the areas of planning, engineering geology, hydrology, botany, revegetation, and sedimentation and erosion control. It operates very much like an extension program that provides technical assistance to lead agencies, the mineral industry, and the public. It fulfills a SMARA requirement that the State furnish technical assistance when requested by cities and counties involved in the reclamation planning process.

One of the challenges facing the State has been to provide statewide insights and approaches to a reclamation planning process that essentially takes place at a local level. Projects have shown great diversity. Even the term "reclamation" has a variety of different meanings to the various participants in the planning process. The spectrum runs from reclamation being understood as sowing some grass seeds to projects which use the full breadth of the definition found in SMARA itself.

Recognizing how essential it is to establish, through communication and education, a baseline of understanding from which all participants in the reclamation planning process (including the minerals industry and the lead agencies) can

work, Ms. Mankoski and her colleagues in the Reclamation Program have been developing a publication entitled "Surface Mined-Land Reclamation Planning and Implementation in California", which is now undergoing peer review. Included are chapters on planning, subsequent uses, ground and surface water management, erosion and sediment control, land shaping and revegetation. A Glossary and Annotated Bibliography is also available from the State Department of Conservation, Division of Mines and Geology. Two major premises inherent in the publication are: 1) that reclamation can be cost effective and often times will generate a second profit from the land resource; and 2) that reclamation is a site specific planning activity. The publication promises to be a valuable tool in developing cooperative reclamation planning and implementation processes.

Barite Mine, Spanish Mine, Nevada County, California, Photo by Zoe Mankoski, Mines and Geology

* **JOHN MASHAM**, Aggregate Enforcement Policy Advisor in the Industrial Minerals Section, Department of Resources, of the Province of Ontario in Canada, described Ontario's innovative aggregate resource management and rehabilitation strategies. Ontario has abundant aggregate resources, but rapid development in the 1950's and 60's resulted in a major increase in production. Most of it occurred close to the urban centers in southern Ontario where 88% of the Province's people reside, and where land use competition is severe. At that time there were no effective controls on aggregate operations or requirements for rehabilitation and, inevitably, environmental and social problems resulted.

In recognition of these problems, and in response to uncertainties about future availability of near-market sources due to land use pressures and planning concerns, the Provincial Government has become increasingly involved with the management of aggregate resources. The components of Ontario's resource management strategy include legislation, planning policy, resource evaluation and rehabilitation.

A copy of a paper on the subject can be obtained from the author by contacting him or her at the address provided in the reference guide at the end of these Proceedings

Rehabilitation is seen as a cornerstone in the successful implementation of this strategy. Ontario's objective is to ensure the continuing availability of aggregates, at reasonable cost, with minimal disturbance to local residents and the environment.

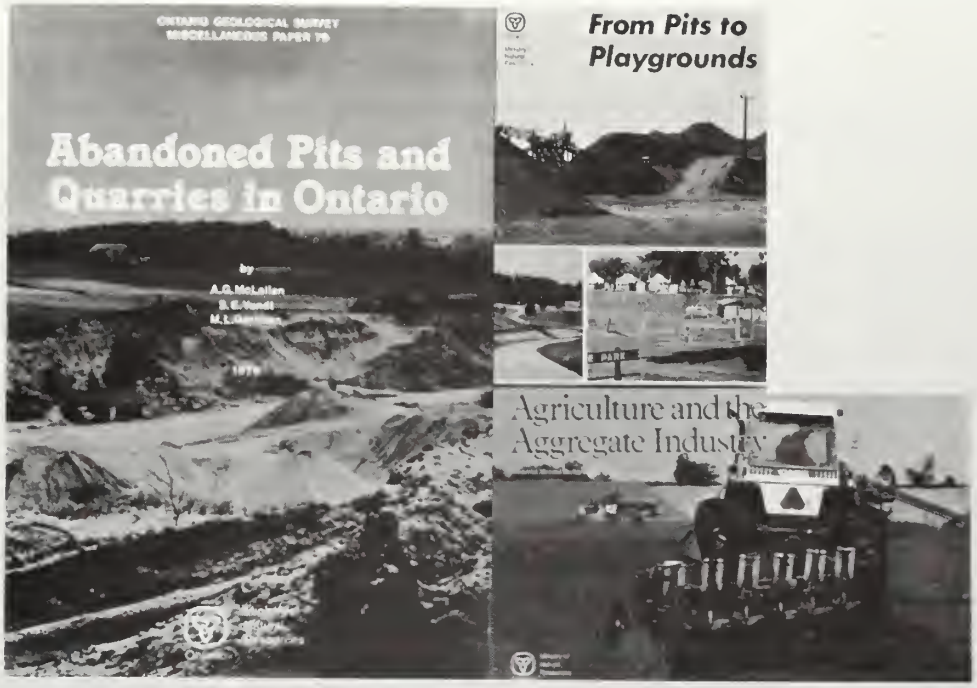
Two separate but complementary mechanisms have been developed to achieve this objective. The first is the Pits and Quarries Control Act which regulates the operation of pits and quarries. It requires their rehabilitation under the terms specified in the license or permit. A "rehabilitation security" is collected based on the production of the operation, creating a fund which is refundable as the required rehabilitation work is undertaken. A license cannot be issued in contravention of a municipal official plan or zoning. This legislation applies only to private lands in designated parts of Ontario, but it covers about 90% of the total production area.

The Mineral Aggregate Resource Planning Policy provides direction to municipalities and Provincial Ministries regarding the planning of aggregate resources and pits and quarries. Among other things, it requires: protection of aggregate resources under the provisions of locally adopted municipal plans and zoning bylaws; provision of detailed aggregate resource mapping to municipalities by the Ministry of Natural Resources; and, in municipalities, official plans to serve as a baseline for an equitable process for considering new pits and quarries, and policies for reclamation.

According to Masham, the intent of the two laws is to meet Ontario's primary objective of ensuring continued availability of aggregate resources without damage to the environment and disturbance to local residents, while maintaining the viability and competitiveness of the private aggregate business. The Pits and Quarries Control Act and the Planning Policy encourage progressive rehabilitation wherever feasible and in concert with local plans.

A special provision of Ontario's agricultural policy requires that new pits and quarries which are located in high quality farmland be rehabilitated back to the same general agricultural quality as existed before mining began. In certain key specialty crop areas, requirements are even more stringent. Aggregate extraction is only permitted if it can be demonstrated that the site can, and will, be restored to its former crop category and productivity.

Ontario also has established a vigorous and ongoing research and publication program focused on all aspects of aggregate resource management (including rehabilitation studies) to provide industry and others with state-of-the-art information.



Collage of Ontario Publications, Province of Ontario

* **ROBERT ANDERSON**, Deputy State Director (Minerals), of the California Office for the Bureau of Land Management, defined BLM policies for reclamation and second use. As stewards of public lands, the BLM is charged by the U.S. Congress to implement the principles of conservation (the wise utilization of resources) and multiple use. Multiple use provides for individual uses, such as wilderness or surface mining, though Anderson questioned whether mining could perhaps be better described as an interim or sequential use (which would still be appropriate on BLM lands).

Because the BLM manages the public lands for all Americans, it has a duty and an obligation to listen to the opinions of the public and be responsive to their concerns. According to Anderson, this makes his work and the mining industry's job more challenging. Both the BLM and the mining industry know what can be accomplished in reclamation. All agree that reclamation plans must be an essential component of the mining cycle, and that reclamation must be pre-planned right along with site preparation, excavation, transportation and the sale of the ore. Anderson differentiated between the words "reclamation", "rehabilitation", and "restoration", and urged that a common vocabulary be developed that would clarify the language involved in land use discussion associated with mining operations.

Anderson cited three categories of minerals that are distinguished by six separate Acts of Congress. The 1872 Mining Law covers locatable minerals such as metallics and some nonmetallics. The 1920 Mineral Leasing Acts, the 1940 Mineral Leasing Act for Acquired Lands, and the Geothermal Steam Act of 1970 all cover leasable minerals such as coal, oil, gas, oilshale, phosphate, sulfur and potassium. The 1947 Materials Act and the Surface Resources Act of 1955 cover salable

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minerals such as sand, gravel, cinders, decorative stone, and construction aggregate.

The process of developing leasable and salable minerals is slightly different than that which applies to locatable minerals. Leases, permits and contracts on leasable and salable minerals are issued only after it is determined through the NEPA process specified in the National Environmental Policy Act that anticipated impacts are addressed and mitigated to the extent practical and reasonable. If it is determined that action would be detrimental to the public interest, they may be denied by the BLM District Manager.

The environmental treatment applied to locatable minerals is quite different. It is still possible for an individual to "strike it rich" in America today, and thus there are still many individuals and small companies involved in the production of locatable minerals. These companies often do not have the resources to produce sophisticated mining and reclamation plans, like some companies dealing with leasable minerals or larger companies competing with them for locatable minerals. The operation and reclamation of locatable claims are covered by the Federal Land Management Policy Act, which requires reasonable reclamation of the areas disturbed.

It is the Bureau of Land Management's policy to have an attitude of cooperation, not confrontation, while working with both the small operator and the large corporation. They try to offer as much latitude as possible to encourage companies to be creative in designing productive second land uses for the public lands on which their mining operations take place.

PAUL LAWSON, Supervisor of Oregon's Mined Land Reclamation Program in the Department of Geology and Mineral Industries, discussed the State of Oregon's approach to mining and reclamation, pointing out that it is particularly designed to benefit and recognize the working conditions of the many small mine operators in the State.

Oregon would like to balance continuing mineral productivity with future beneficial use of the land without causing pollution and while maintaining a safe condition in the mining operation. This position is supported by a Legislative Policy which declares in part that: 1) extraction of minerals by surface mining operations is a basic and essential activity; 2) proper reclamation of surface mined lands is necessary to prevent undesirable land and water conditions that would be detrimental to the general welfare, health, safety and property rights of the citizens of the State; 3) surface mining takes place in diverse areas where geologic, topographic, climatic, biological and social conditions are significantly different, and reclamation operations and specifications therefore must vary accordingly; 4) reclamation of surface mined lands must allow

for the mining of valuable minerals in a manner designed for the protection and subsequent beneficial use of the mined and reclaimed lands.

Oregon also has a Declaration of Purpose by the Assembly of its Legislature, the introduction to which summarizes the basic intent of the State: 1) to provide that the usefulness, productivity and scenic values of all lands and water resources affected by surface mining operations within this State shall receive the greatest practical degree of protection and reclamation necessary for their intended subsequent use; and 2) to provide cooperation between private and governmental entities in carrying out the purposes of (State mining legislation).

Lawson cites this strong attitude of legislative support as a major factor in the creation of a positive atmosphere in the permitting process and the ongoing regulation of surface mining. The Mined Land and Mineral Industries Program seeks to meet the objectives of the State law in several ways. They employ professionals with appropriate training and prior experience. Sites are treated on a site specific basis, rather than relying on a large mass of regulatory detail, attempting to work around the demands of local politics and make decisions and requirements based on a professional, common sense basis.

A strong emphasis is placed on friendliness, cooperation and assistance. Enforcement is used only to the extent necessary, but it is also prompt and positive in an even-handed way. Outstanding reclamation is publically recognized. Key laws and regulations are closely adhered to. Fees in arrears must be paid before current permits will be issued and sites subject to reclamation must keep their permits current until mining is complete and reclamation has been completed to acceptable standards.

The Oregon Mined Land and Mineral Industries Program believes strongly in positive reinforcement, including encouragement, support and praise for voluntary reclamation, and in the identification of the economic potential of various approaches to reclamation to land owners. They closely coordinate with other agencies to make communication and regulation simple and specific.

Permits issued by Mined Land Reclamation (MLR) are not permits to mine; they attest to compliance with the Mined Land Reclamation Act, including the filing of an approved reclamation plan and the posting of security. Decisions about the actual land use are the perogative and responsibility of the local government. The actual permit process for a mining operation can involve the input of many agencies and requires a long period for public comment before the mining permit can be issued.

Lawson attested to the effectiveness of the program in meeting Oregon's needs as a State, and in support of the mining industry as well. As of June 30, 1984, over 1400 acres of land have been reclaimed and over 3350 acres are under bond or security for eventual reclamation. Of the 1400 acres, 600 were reclaimed to agricultural use, approximately 300 to forestry, about 60 to housing, and over 400 to a wide variety of other productive second uses.

SHOWCASING SUCCESS

Reclamation Abroad

WORKSHOP PANELISTS

STUART MC RAE
Wye College, University of London

NORMAN GILROY
Norman T. Gilroy and Associates

JAMES A. ROBERTS
Consulting Geographer

PETER LANGKAMP
Shell Australia

Reclamation Abroad

Since the beginning of the Industrial Revolution, large areas of England, Wales and Northern Europe have been the sites of both underground and surface mining for coal, iron, slate, limestone, precious metals and a wide variety of rock products for the construction industry. Much of the activity took place in areas where a great number of people were clustered in a relatively small area, requiring the communities involved to develop sophisticated approaches that allowed their co-existence with mining while preserving or restoring the quality of life in their growing urban society.

Similarly, North America and mineral-rich Australia have been experiencing a growing interest in reclamation of mined lands as the search for energy products and construction products continues in an ever-growing economy. New research continues to develop, particularly where environmental concerns are being given increasing priority.

The conference presented a unique opportunity for an exchange of knowledge between people with experience from a number of information-rich parts of the world.

Bush Farm Experimental Research Station, England, Photo submitted by Dr. Stuart McRae

* **STUART McRAE**, a lecturer in the Department of Environmental Studies and Countryside Planning at Wye College (University of London), discussed the practice of reclamation to agricultural and open-space uses that has been developed in Britain. He emphasized that there are many restraints on the working of minerals in a small, densely populated country such as Britain. Mining inevitably occurs close to housing and

* A copy of a paper on the subject can be obtained from the author by contacting him or her at the address provided in the reference guide at the end of these Proceedings

highways, and it inevitably causes visual intrusion and loss of, or adverse affects on, woodlands, important buildings, archeological sites, and areas of nature conservation interest.

Preservation of high-grade agricultural land is given priority in Britain, and that normally precludes mineral extraction. There is, however, an exclusion clause in British legislation which allows agricultural land to be released if it can be shown that it is possible to restore it to its original quality once mining is complete. Sometimes, therefore, restoration of mined land to an after-use other than agriculture can be acceptable if given prior approval. The more responsible mineral operators in the United Kingdom now are experienced in preparing quite elaborate restoration schemes, and they often seek public recognition for good agricultural restoration which they have carried out.

McRae took issue with the British policy that requires "restoration to the previous status quo" wherever possible, i.e., a return of agricultural land to agriculture, and woodland to woodland, etc. In his view, that approach can often be technically unfeasible and practically inadvisable when local conditions are taken into account. McRae expressed his frustration with the way that the mining industry, at times, gives itself "self-inflicted wounds", using poor practice at an early stage in the project (e.g., forgetting to save the topsoil or grading to uneven contours) that effectively prevents restoration to any useful after-use. Good operators avoid these problems. In Britain, they frequently include interim uses in their plans like land filling operations that dispose of waste materials such as pulverized fuel ash or domestic garbage.

In the past, reclamation was "left to mother nature". Nowadays a great deal of the responsibility for reclamation falls squarely on the shoulders of the mineral operator, who is then faced with funding the reclamation out of operating profits or from the proceeds of an interim use such as land filling. In the United Kingdom, there is, in addition, a considerable legacy of "derelict lands" caused in part by mineral extraction. Large amounts of public funds have been spent in recent years to reclaim derelict land to productive second uses of value to the community.

While poorly restored lands can be an embarrassing financial liability to the mining operator, McRae feels that well thought out restoration can be self-financing or can even produce a profit after the initial cost of reclamation has been paid. Farming is one use which has shown excellent prospects, as have low-key recreation activities such as sailing or fishing. Developmental after-uses have proved to be very successful in Britain, with uses ranging from theme parks to housing and light industry. Some of the benefits from reclamation are, however, intangible, since it is only the companies that have built a good reputation in their past work which are granted

the permits for future mining operations that will enable them to continue in business.

Home Pierrepont National Water Sports Center, England - sailboats and race course

* **NORMAN GILROY**, speaking as President of The Institute for the Human Environment, described a number of projects in the United Kingdom that were visited by a team of North American experts in reclamation planning who visited Europe in an Institute sponsored program in June and July, 1984. A number of the delegates to the program were conferees and panelists at Asilomar.

At Holme-Pierrepont near Nottingham, a large sand and gravel mining operation adjacent to the River Trent is being converted into a major water sports facility built to international competitive standards. A 2000 meter water course is used for power boat racing, rowing competitions, sailing and canoe racing. It's banks are lined on weekends by dozens of fishermen competing in angling competitions, a popular British past time, and the site is used frequently for horse shows and jumping competitions, hot air balloon races, ski boat races, amphibious aircraft meets, water skiing, camping, etc., etc. A number of international events have been held at Holme-Pierrepont drawing a very large visitor attendance which indicated, in Gilroy's view, the potential feasability of a self sustaining activity on the site. The project is, however,

* A copy of a paper on the subject can be obtained from the author by contacting him or her at the address provided in the reference guide at the end of these Proceedings

constructed and managed by Nottingham County, the local municipality, which provides low cost subsidized accomodations and facilities for sportsmen nationally and even internationally. The project is, however, a good model for what could be done in other areas (either commercial or non-commercial), assuming the presence of a large regional population with an interest in watersports and outdoor recreation.

Gilroy commented that reclamation in the United Kingdom seems to divide itself neatly into two categories, 1) rehabilitation, often to the previous "status quo", and 2) reclamation and conversion to second uses, often very innovative in concept and design. He commented on two theme parks that had been built in different regional areas of the United Kingdom (Thorpe Park and Billing Aquadrome) and where mining companies have developed a viable commercial-recreation and visitor use that is functioning concurrent with the later phases of the extraction operation.

Gilroy was impressed by the ability of the Open Cast Division of the National Coal Board to accomplish simultaneous mining and reclamation projects that break even or make a profit, moving over the landscape in a way that requires only a minimum acreage of land to be exposed for mining at any given time. Some of the NCB's experimentation with forestry as an after-use shows the potential for the development of high yield timber crops concurrent with the restoration of the aesthetic and environmental quality of the land.

Gilroy also cited numerous examples of conversion of mining properties to tourism uses in the United Kingdom. The Llechwed Slate Quarry at Blaeneau Festiniog in North Wales is an example where a mining company has taken the initiative to capitalize on a growing public interest in the history of North Wales and the lifestyle of the miners and mine owners of the past. Llechwed provides the visitor with an opportunity to spend a few moments in the total darkness of a slate cavern hundreds of feet below the ground, to ride the mine railway down an inclined shaft, and to understand the way such elemental amenities as light, fresh air and transportation are handled in a deep underground mine. On the surface visitors can see the art of slate splitting, making a link between the mining source and a type of roofing material used throughout the United Kingdom. Only a short distance away, the visitor can see the present-day slate quarry operating at full-bore on the mountainside above. The Open Air Museum at Big Pit in South Wales is another example of a mine turned to museum and education facility, as is the Beamish Open Air Museum near Durham in North England.

Gilroy suggested that the National Stone Center proposed by BACMI, an association of British mining companies, for a site north of Nottingham was an interesting model that deserves the attention of mining associations in North America. A working

museum and conference center that uses four quarries (connected together by walking paths and conference facilities) will provide the mining industry with an unusual opportunity to educate both the general public and decision makers who must rule on mining permits in the future. Just the presence of such a facility will provide incentive for the preparation of new educational materials, and will keep the mind of the mining industry focused on the need for public education. The Center will provide the industry with many opportunities to present their interests in a positive light and to emphasize the importance of mineral products in the daily lives of the community at large.

Southern Holland near Maastrict, reclaimed sand and gravel mining area along Maas River, Photo by The Institute for the Human Environment

* **JAMES A. ROBERTS,** consultant, geographer and environmental planner, also spoke from the perspective of a participant in the Institute's European Study Tour in the Summer of 1984. He commented that he had noticed that a common denominator in almost all of the major second use conversion projects that he saw in Holland and Germany was the active presence of a "power-full" person, who had the vision and the energy to see the project through. Frequently after-use projects were the personal concept of a motivated individual who stuck with the project over a long period of time, managing it through its various phases of approval, reclamation, enhancement, development and finally marketing and implementation.

As an example, Roberts discussed the massive redevelopment and reclamation project that has been taking place over the past 10 years in an abandoned coal mining region near Heerlen in the South of Holland. There, a highly motivated engineer and developer (who is also a consumate politician) has led a

* A copy of a paper on the subject can be obtained from the author by contacting him or her at the address provided in the reference guide at the end of these Proceedings

publicly and privately funded drive to reshape and landscape the wastepiles of the old collieries, clear and convert abandoned industrial areas, build and upgrade new office buildings and facilities for new industry and business, and construct housing and recreational and cultural amenities for a whole "new" community being established there. An extensive retraining program is enabling workers, displaced by the closing of the mining operations throughout the region, to find new employment with the new industries growing there, providing new hope and building resources of income and revenue in the community. The project is an interesting balance of public and private enterprise, with many new organizations being attracted to the area by aggressive marketing, and with regional facilities (like the horseracing and trotting track and a year round brush-skiing course on a re-shaped colliery waste tip) being operated by private enterprise. The project reminded Roberts of the kind of innovation, energy and leadership being shown at Corby in England, where a very motivated City Manager and City Council are using "enterprise zone" mechanisms to convert an abandoned iron mining and steel town into a new high-tech industrial park and New Town of very large proportions.

Roberts also viewed with interest the reclamation work being accomplished on derelict lands in the industrial Ruhr region of West Germany. Under the leadership of a quasi-public organization set up for the purpose, massive waste tips which have long dominated the landscape of the area have been turned "from black to green". By reshaping the land, landscaping and providing roads, services and hiking trails, the Kommunalverband Ruhrgebiet has developed a network of pleasant and useful linked openspaces which meander through the extremely dense urban development of this very active region. The improvement that has occurred in the local quality-of-life is now proving to be a major factor in local efforts to attract high-tech businesses to the area - businesses which frequently use "environmental quality" as a selling point to attract high quality personnel in a very competitive market.

Roberts commented most favorably on a horticultural park at Hamm, West Germany which the North American delegation had visited. Not only had a pleasing landscape been created from what was once an abandoned colliery and industrial area, but a cultural facility, including concert hall and public museums and galleries, had been created from the gymnasium and administrative buildings that used to serve the old coal mine once located there. Roberts found it interesting that even though the horticultural show had attracted over 700,000 fee-paying visitors in its first year of operation, the local government's intention is still to close the horticultural exhibit after another season of operation, converting the area to a public park to be enjoyed free of charge by the residents of the region.

* **PETER LANGKAMP**, Environmental Advisor for Resources with Shell Australia in Melbourne, discussed the process of reclamation used by industry on rural sites in Australia. There is a growing interest in the effect of industrial activity on the environment in Australia that has been particularly compounded by the realization that many important ore deposits are within, or close to, areas of relatively dense population. Environmental legislation has been introduced by both the Federal and State governments, with an environmental impact study now being necessary from nearly all major development proposals. In mining permit applications, the findings of these impact studies are frequently translated into specific lease conditions which make provision for rehabilitation and management.

In Australia, the term reclamation is used to cover all aspects of any process which encourages the reuse of damaged land. Essentially, it consists of two parts: 1) restoration, which is essentially the engineering task of infilling and leveling the area, and 2) rehabilitation, which is the return of an area to long-term productive use. "Conditional rehabilitation" is effective so long as management controls are available to ensure that the land will be maintained and the process of rehabilitation can be adjusted to augment or counteract natural forces. Conversely, "self-sustaining rehabilitation" results in a restored area where human inputs are no longer required and the vegetation and nutrient cycles are as "closed" as before man caused the disturbance. Many sites evolve from the "conditional" state to the "self-sustaining" state as a normal part of the process of rehabilitation.

Langkamp stressed the need to fully integrate rehabilitation programs into a company's activities at the planning stage of the operation. A high level of commitment is required from the beginning of the operation, since the attainment of ultimate objectives will be far easier and much cheaper if the necessary steps can be taken at the right time. Early planning allows guidelines to be written into legal agreements and included in Shire plans, or government policy.

However, in practice in Australia, most agreements only mention post-mining land use plans in the vaguest of terms. Where mining occurs on Aboriginal Reserves or private land, meetings with Aboriginal Councils and regional landowners will determine the possible land use options. Where Crown Land is mined, land forms similar to those that existed before mining are required so that the restored area can blend with adjoining undisturbed land forms.

Rehabilitation programs need to be integrated with economic planning. At mining sites located on Aboriginal Reserves such as the Comalco Company's operations at Weipa, Queensland, and the Groote Eyelandt Mining Company's operations in the Northern Territory, research programs are investigating the

* A copy of a paper on the subject can be obtained from the author by contacting him or her at the address provided in the reference guide at the end of these Proceedings

feasability of forestry as a cash crop as well as the feasibility of high-yielding pastures and agricultural crops.

Particular care and attention is given to areas considered "environmentally sensitive". In the leased areas operated by Mineral Deposits Limited in the Myall Lakes region of New South Wales, priority was given to the return of the native ecosystem after mining. At Alcoa Company's bauxite operations in the Dowling Ranges of Western Australia, care was taken to avoid damage to the Jarrah Forest canopy and special precautions were taken to avoid the spread of a dangerous fungus found in the natural condition.

A wide diversity of mining operations and climatic conditions can be found in Australia. In the Pilbara Region of Western Australia, this has meant a search for plants that must be able to withstand high summer temperatures, be very drought resistant, tolerate dusty conditions, withstand strong winds, and have an ability to recover from fires.

In Northern Australia and New South Wales, scientists are experimenting with techniques of soil handling and fertilization to maximize the return of seeds and other propagules, and in Queensland, the pelleting of small seeds with fertzilizer is very common. Hydroseeding is commonly used in the mining industry throughout Australia, particularly in difficult terrain.

Langkamp closed by saying that the trend in Australia is for more research to be carried out in the pre-commitment phase of a project, often in association with regional universities. Langkamp feels that the Australian mining industry has realized for some time the desirability of rehabilitating worked out areas and has responded with the development of a technology capable of accommodating a variety of post-mining land uses aims in a wide range of natural ecosystems. He felt that conferences and other opportunities to meet experts with state-of-the-art knowledge are very important in this rapidly developing area of activity.

Planning for the Second Use

WORKSHOP PANELISTS

SCOTT SLOTTERBACK
Norman T. Gilroy and Associates

CHARLES TAYLOR
Geomatrix

JAMES A. ROBERTS
Geographer and Environmental Consultant

Planning for the Second Use

Maximizing the second use values of mined lands is a process which requires thoughtful planning, starting at the beginning of a project and continuing through each of the phases that leads to conversion to the second use. Careful planning can result in increased economic returns to the mining company, and in short and long-term benefits to the community. Reclamation planning requires a sound data base that defines the location of the resources, the environmental sensitivity of the land, the extent and trends of surrounding land uses, and the likely long-term growth trends in the area. Early geologic studies are vital to define the extent of the resource as a first step to shaping the land as the mining process progresses. The environmental review process can also be turned to advantage by meshing the goals of the mining company, community desires, and the mandatory requirements for the environmental documents. The result can be quicker project approval with less tendency toward the polarized debates so common in the permit review process in many communities.

* **SCOTT SLOTTERBACK**, Reclamation Project Manager of Norman T. Gilroy and Associates, discussed the process of land shaping that occurs in a mining operation, and the similarities between the land forms necessary for many secondary uses and the land forms created by the mining process itself. He illustrated ways by which tha land shaping process associated with mining can improve the value of the site and its suitability for development, farming or recreation.

Basalt Rock Company's McNears Quarry project in Marin County, California, is an example where careful geologic studies and directed earth shaping are creating valuable waterfront sites in a location where the views over San Francisco could easily have been obscured if a different mining approach had been used. In this instance, taking the time to carefully analyze a specific portion of a project resulted in a higher yield of rock products to the mining company, and a higher real estate value once mining is complete.

Slotterback underscored the value of long-range planning leading to a phased development process for implementing the

* A copy of a paper on the subject can be obtained from the author by contacting him or her at the address provided in the reference guide at the end of these Proceedings

second uses. A mining operation may have a life of 10 to 20 years. Within that time frame there is ample room to negotiate community acceptance and zoning for the second use, and to phase-in improvements that will increase the value of the second use. If the mining company is alert and diligent it can ensure that the utilities, water and sewer services needed to serve the planned second use will be installed by the action of local public agencies and assessment districts. By the time mining is complete, services may have been extended to the fringes of the mining site, thereby increasing the second use value of the mining property. However, Slotterback cautioned that it is important to carefully monitor the trends of adjacent urban growth to ensure that the planned second use does not "get locked out".

Aerial view, McNears Quarry, Marin County, Photo by Hogan Schock and Associates.

CHARLES (CHUCK) TAYLOR, Senior Geologist with Geomatrix of Oakland and San Francisco, discussed the importance of exploration to the development of potential second uses on mined lands. With the understanding of subsurface conditions that can be developed through geologic exploration, an effective plan for extraction and reclamation can be developed.

Because each mineral resource is unique in location, geology and characteristics, detailed knowledge is an essential ingredient to the design of a productive mining operation and the establishment of productive second uses which maximize the economic return and are responsive to environmental considerations. The cost of exploration can be more than offset by greater profits in the extraction phase of the operation and by the increased land value as a result of the second use.

In the long run, Taylor feels that it is clear that focused exploration of the resource enhances not only the extraction process, but also aids in the design and development of new uses.

* **JAMES A. ROBERTS**, Geographer, Natural Resources Planner, and Environmental Consultant, discussed "Turning the Environmental Review Process to Your Advantage". From Robert's point of view the environmental review process, as exemplified in preparation of the EIR or EIS for a project, is a powerful decision making tool. The review process provides an opportunity for the mining industry to put its best foot forward in creating public trust and support. The goals of the review are to educate all parties involved with the considerations involved with a project, and to air the issues confronting the industry, the planners and the public.

"Scoping" is encouraged by the environmental regulations. Scoping is an opportunity for all interested parties to clarify the parameters of a project and to define its limitations. If this process is complete and well managed, the mining operator can know exactly where he stands and how to proceed positively in the permit process.

Roberts also urged mining operators to practice full disclosure and be honest with the public and with planners. He suggested planning for the second use well ahead of time, and using the environmental review process to involve the public in the act of determining potential second uses. A compatible second use can serve the desires of the community as well as the economic needs of the mining industry.

In Robert's view, cooperation between public agencies and private industry is the key to successful project planning, and economic benefit to the mine operator is the result.

DISCUSSION focused on specific techniques that were detailed in Jim Roberts' presentation to enhance communication during the environmental review process. Emphasis was placed on the importance of the public education process and the need for the mining industry to take an active role in that process. Jim Roberts reiterated the importance of keeping communications with the lead agencies, and the public, simple and honest.

Participants felt that the most productive projects were the ones that were meeting the public need for mineral resources, and concurrently developing second uses that were of real value to their local communities. In these kinds of projects, thorough planning and careful implementation lead to greatest success for both the mine operator and the surrounding community.

* A copy of a paper on the subject can be obtained from the author by contacting him or her at the address provided in the reference guide at the end of these Proceedings

PLANNING AND IMPLEMENTING
THE SECOND USE

Second Uses – A Medium for Developing Relationships Between Industry and the Community

WORKSHOP PANELISTS

MICHAEL GERSICK
Grattan/Gersick/Karp

ALCIDES FREITAS
Sacramento County Planning Department

JOHN BUSTERUD
Ecology & Environment, Inc.

Second Uses – A Medium for Developing Relationships Between Industry and the Community

Mining operations stand to benefit from developing good working relationships with the local community and with the government officials who are responsible for the review of their mining operations on behalf of the community. Frequently a proposal to begin a mine or expand an existing mine generates questions and controversy in the community. A thorough reclamation planning process is one which recognizes both the mining process and the potential second uses of the land, and that includes open discussion with representatives of the community affected. Such a process can result in mining and reclamation that are not only successful for the operator, but also produce assets of great value to the local community. Both the mining company and the community can benefit from replacing confrontation with a process of negotiation and mutual understanding.

MICHAEL GERSICK, Principal with Grattan/Gersick/Karp, Administrative Advocates in Energy and Resources, in Sacramento, and former Deputy Director of California's Department of Conservation, discussed how to achieve productive relationships with the local community. Gersick sees the attitude of the mine operator as the critical factor in developing positive communication with local communities and permitting agencies. Too often, Gersick feels, mining companies limit productive communication by adopting inflexible positions.

Gersick explained that, in establishing good community relations, a project proponent is pursuing the objective of building support for the project. He needs to identify and support the elements within the community which find the project beneficial. Equally, he needs to identify the elements in the community which are, initially at least, in opposition to the project. The opposing section of the community should then become the target for a carefully planned effort to educate and persuade.

This phase of project development is quite like the process used in conventional marketing. The developer, in taking the initiative, has the opportunity to present the proposal from his

own viewpoint, factually and with the emphasis that he chooses. Gersick mentioned three characteristics of such a marketing approach:

1. A defensible and understandable assertion that the project design is consistent with the requirements of environmental law in fact as well as in appearance;

2. An illustration of how the project design acknowledges local social and cultural patterns;

3. A portrayal of how the project will contribute to the general benefit of the locale. (Gersick expressed his opinion that this approach must go further than the typical projections of "new jobs" and "expanded tax base". It should illustrate the potential for physical improvements and amenities, recreational resources, new industries or industrial sites, etc. All could be productive second uses of the mined land involved.)

Gersick stated his belief that it is useful to separate project development from the marketing of the mined materials, recognizing that the cost of the mined materials is borne by one consumer group and, the cost associated with the presence of the mine itself is borne by another consumer group -- the residents of the locale, who pay in terms of the impacts on their quality of life, and environment. In Gersick's view those costs can, and must, be compensated for and the compensation must be agreed upon before a "sale" can be made, i.e. a permit is granted. The CEQA process may identify the compensation, but the "sale" can be "closed" more expeditiously (and often more economically) if a process of negotiation begins early with the local consumers, i.e. the government agencies, media, service clubs, special interest groups, and business organizations in the locality.

ALCIDES FREITAS, Environmental Coordinator with Sacramento County and a member of the California Mining and Geology Board, shared his concern that the real problem facing the mining industry is not planning for second uses, but convincing the public of the need for the mining operation in the first place.

Before there can be improved relations between industry and the public, all parties involved must have a clear understanding of each other's concerns. The local resident has to learn, and be informed, how important mineral resources are to his life and to society, now and in the future. Mining companies, on the other hand, must take the residents' fears of dust, traffic, noise and safety hazards as tangible and valid. Local government represents the interests of all the people, and must recognize and balance fairly the needs of the industry and the concerns of local residents. Though he thinks that it is naive to believe that all problems can be resolved to everyone's satisfaction, it is possible that many

practical solutions to complex problems can be instituted through local government and industry cooperation.

JOHN BUSTERUD, environmental consultant and senior counselor for Ecology and Environment, Inc., former Chairman of the President's Council on Environmental Quality, and former President of RESOLVE, presented his perspective on environmental conflict resolution and its value in mitigating problems in land use planning. Busterud suggested that there is often a considerable gap between the reality of a project proposal and the perception that the community and environmental groups and regulators have of the facts surrounding the project. Project planners must deal effectively with both the "substantive" and "perceptual" dimensions of this problem if a second use plan is to be approved by these key participants in the public policy debate.

Busterud recommended the use of mediators specially trained in conflict management as a way of finding alternatives for dealing with difficult and complex controversies. The first step in the process is to carry out a conflict assessment that identifies the parameters of the issues. At this point, a mediator can provide different kinds of assistance: identifying concerned parties, encouraging definition of the issues, assisting in strategy assessment, helping parties understand their limitations, drafting agreements and implementing settlements. These actions can be accomplished through conflict anticipation, joint problem solving, mediation and policy dialogue. Conflict anticipation identifies potential conflicts early in the planning process, provides community input into the plan, avoids entrenched positions, utilizes workshops, and scopes the project. Joint planning and problem solving involves clarifying and resolving differences before polarization sets in and generating alternatives. A facilitator is used rather than a mediator, and consensus building takes place at each step.

Mediation is a more traditional approach coming after deadlock. It involves a neutral mediator who focuses discussion, suggests alternatives, and helps to narrow issues. The mediator often shuffles back and forth between the parties to seek resolution of issues. While each of these approaches is different, there are certain common elements. Each involves interaction of the parties, is not legally binding, builds confidence, and is cost effective. Busterud believes that conflict anticipation could be employed early in the planning phases of a proposed quarry project, for example. Joint problem solving could be of value where a mine already exists and a second use plan is being considered. Mediation might be appropriate after the issues are clear and an injunction prohibiting a proposed use has been granted.

Another form of third party intervention, policy dialogue, is

particularly useful in developing criteria for action and for narrowing issues. It might be used, for example, in the development of criteria for adopting state regulations applicable to second use proposals. According to Busterud, the basic necessity in applying conflict management to any conflict is the use of common sense and good judgement. He reiterated that community officials and citizen groups must be involved in the planning process if it is to be successful. However, how they are involved is equally important. They must play an active role and perceive that their opinion will be considered in the plan development.

DISCUSSION focused on the need for greater industry involvement in the community to counteract a negative public image. At times, even the scientists and geologists who act as consultants to the entire environmental study process are seen as adversaries to both the community and the mining company. Several potential areas of friction between different levels of government were mentioned. Participants from California felt there was a lack of comprehensive, State-wide planning in order to protect important resources. Counties, on the other hand, are unwilling to grant the State that degree of sovereignty, as it counters a long tradition of "home rule".

On the whole, participants felt that it is important to clarify issues through conflict management, and that misunderstanding is often the root of problems in communication between the industry and local communities.

PLANNING AND IMPLEMENTING
THE SECOND USE

Computers and Models as Planning Tools

WORKSHOP PANELISTS

FRED A. MATTER
University of Arizona

M. DOUGLAS SCOTT
Montana State University

GIL CASTLE
Comarc Systems

PLANNING AND IMPLEMENTING
THE SECOND USE

Computers and Models as Planning Tools

Technological advances have changed the way long range planning is carried out for mining properties. Computers can now store enormous amounts of usable baseline information and make programmed value judgements. They can graphically model land forms at various phases of the mining operation, allowing neighbors to view each phase of operation proposed. Three-dimensional models can enable mining companies to examine the effects of a wide variety of land configurations before finalizing their Mining and Reclamation Plans. Land shaping and second use approaches can be evaluated to provide a guide for the mining activity. New hardware, software and techniques of evaluation are becoming available every year. In this workshop, a group of experts in the use of computers and modeling techniques for planning discussed their work and looked at opportunities for the future.

* **FRED MATTER**, of the University of Arizona in Tucson, is experienced in the use of physical models in studying alternative solutions for mining projects and in making effective presentations to local communities. He is the coordinator of the University's Mining Projects Group which has developed the use of models in planning, primarily for open pit mining in the Western U.S.

Matter illustrated the modeling process his group has developed, using slides of three Case Studies. He cited the primary function of the Mines Project Group as "communication and synthesis of ideas", and explained their view that models could be useful tools to clarify problems and explore alternatives, both in the design of mining operations and in the development of layouts for productive second uses. He also stressed the value of computers in gathering baseline data that could then be used to create a variety of physical models. Computers can also be used to accurately predict possible costs of projects or phases of projects.

The Mines Project Group has used topographic maps to develop physical models that allow them to explore the potential effects of waste dumping, and they have used photo overlay processes to analyze the potential success of proposed reclamation

* A copy of a paper on the subject can be obtained from the author by contacting him or her at the address provided in the reference guide at the end of these Proceedings

techniques. Matter discussed the value of physical models in communicating with the public. They are light and easily transported for use in meetings and hearings, and are a "hands on" technique that helps the layman and the decsion maker to envision future land forms.

Computer modeling, on the other hand, allows an infinite variety of changes to be experimented with, without making firm commitments to any one aspect of a project or another. It is part of the Mines Project Group's ultimate goal to look for reclamation strategies in each of their projects that have the potential for becoming self-supporting land uses and/or profit making ventures. It is inherent in the philosophy of the group that land is too valuable a commodity to ever stop considering its potential for continuing human development.

* **M. DOUGLAS SCOTT**, of the Institute for Natural Resources at Montana State University, discussed the use of computers in analyzing and comparing various second use concepts for mining projects. He feels that they can provide fast, cheap and objective information. He stressed the key to sound reclamation planning is in evaluating options and alternatives rather than predetermining a second use that may not be appropriate to the site conditions.

Scott described a computerized reclamation planning system called CLAIM-II which he has developed. It is a mini-computer system that compares five general land uses for their relative feasibility and cost to reclaim. The five uses include: cropland, native vegetation, wildlife, water-based recreation, and high human use (homes/businesses). The CLAIM-II system was developed for Northern Great Plains Coal Province, hwever, it can be modified for other regions. The system can also analyze the basic environmental data for a site and determine the reclamation techniques and the costs associated with returning the site to each of the five major land uses.

Scott cautioned, however. that a packaged system developed for some other use or site will seldom meet all the needs of a specific mine. It will, however, serve as a starting point for the mining company's programmers to develop systems that are tailor-made for their own situation.

GIL CASTLE, Vice-President of Comarc Systems of San Francisco, discussed the use of graphic computers for contour modeling, view analysis and environmental evaluation in the reclamation planning process. He described the hardware and software for Geographic Information Systems (GIS) that produces computerized maps from a database. There is currently a good deal of software available in the field that can be used to draw 3-D contour models, draw slope maps in

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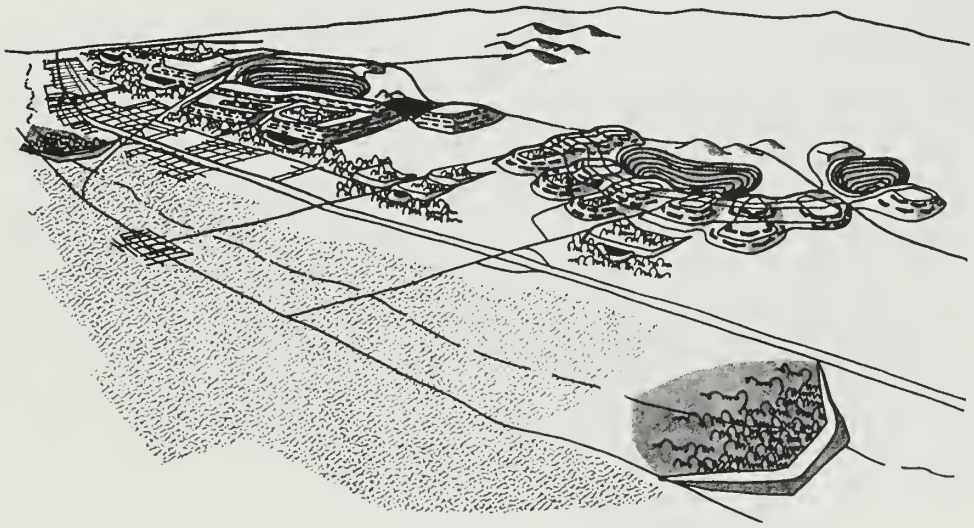
colors, show solar radiation received, show water runoff and drainage basins, and examine viewshed studies from a range of selected vantage points.

Castle appreciates the flexibility of computerized 3-d models for use in public hearings, as they allow the showing of many alternatives for a relatively low cost. They can also be used to layer data on topics such as topography, vegetation, cropland, soils, rangeland, timber, archeology and precipitation, thereby facilitating decision making that takes into account a wide variety of restraints. It is possible to combine all data and give different weights to various parameters, allowing the planner doing an environmental evaluation or planning a second use to evaluate all the alternatives. It is also possible to model the proposed end product first, and then to develop a structure diagram that allows the planner to determine what data is needed for a complete evaluation. Clearly, the computer is a flexible and powerful tool that is just beginning to show its promise.

DISCUSSION focused on the range of particular software packages that are becoming available for particular uses. Hardware configurations and costs were of interest, as were the hardware specifications necessary for geographic uses.

COMARC and SRI were recommended as resources for companies interested in developing computer-based programs.



Modeling Scheme, Santa Cruz Valley, Arizona, Photo from publication "A Balanced Approach to Resource Extraction and Creative Land Development", University of Arizona.

PLANNING AND IMPLEMENTING
THE SECOND USE

The Economics of Implementing and Marketing The Second Use

WORKSHOP PANELISTS

JOHN IGOE
Lincoln Properties

EDWARD "DOC" MERRILL
McCutcheon, Doyle, Brown & Enersen

The Economics of Implementing and Marketing The Second Use

Most mining operations are designed to respond to the need for rapid, short-term quarterly or annual profits. In many cases, however, decades pass before the second uses planned for the site are implemented and produce additional income or land values. Developers and investors involved in the second use project are also interested in a quick turn-around for their money, and they are often reticent to wait the long periods of time that are involved in a mining operation before they see a return on their investment. Markets and political moods change constantly, and to work with a mining site, the long-term investor in land must be flexible and capable of planning his return over the life of the operation.

EDWARD "DOC" MERRILL, real estate attorney with McCutcheon, Doyle, Brown & Enersen in San Francisco, discussed ways of obtaining assurances while maintaining flexibility. This is clearly an issue of importance to the developer, the mining operator, and the local government -- but it is important to each in their own individual way. The operator wants certainty about the use of his land, but flexibility in running his operation and adjusting to local conditions. The developer needs certainty of the later use of the land (and therefore the value of the land), but flexibility to adjust for changing market conditions. The local government needs certainty about the eventual quality of the property after mining is complete and assurances that the second uses will fit the community's long-range plans, but also needs flexibility to adjust for changing political expectations and regulatory standards.

The developer's crucial problem is project uncertainty. To remedy this, Merrill suggests the use of a "development agreement" that guarantees the kind of development that will be allowed when the mining project is complete, but puts the approval of the development into the initial mining permit for the operation. The plan can be "development forcing" so that the community has an assurance that the project will be completed as contemplated. Local agencies may not, however, feel motivated to endorse a development project, but can be persuaded with offerings of trade-offs like the gift of a park or other needed public amenity. The local community can be a

rallying point for support to convince the local agencies of the validity and desirability of a project. The mining industry may also be willing to invest more money in a project if they have the assurance of local support. According to Merrill, despite the long-range nature of the mining industry and its subsequent development potential, it is essential for developers and mine operators to get together to design projects from the start to assure success down the road for both operations.

JOHN IGOE, of Lincoln Properties, a commercial and residential development company with interests all over the United States, also confirmed the value of a development agreement. It is often the only legally binding agreement between the land owner and the community, and can be a valuable baseline document for the agreement between the mining company and the developer. He suggested creating a joint venture relationship, where the developer offers his expertise in working with local agencies, while the mine operator prepares the land through the mining phase of the project.

Igoe does not feel that a major financial involvement could be made by the developer until about four years before the targeted development date, otherwise the cost of servicing the funds invested would outweigh the value of the investment. He discussed the difficulties that can be experienced in working with projects like mining operations that have a ten to twenty-five year life span, particularly in relation to the actions of local agencies which are essentially transitional in relation to the lifespan of the project. He sees the need to define the economic incentives of a project to encourage the local agencies with jurisdiction to act quickly on development plans (increased tax base, provisions for moderate income housing, etc.). He suggested that large corporations or pension funds are more likely to get involved in long-term projects than individual developers. The location of a potential project is exceedingly important to developers. They look for holdings in areas that are expanding and have un-met needs. The closer the project is to an urban area, the more likely it is that an investor will get involved.

Igoe cited difficulties with planning authorities as one major problem facing developers. According to him, planners often do not recognize that developers are making a very large financial commitment in an uncertain future. He closed by stating the criteria used by developers when evaluating potential sites, including: available amenities, hidden costs, available services, political considerations, the stringency of environmental review, permits required, acquisition costs, and the potential for multiple-use development. The greater the variety of potential uses allowable, the greater the interest a property is likely to receive from a developer. Igoe

recommended the use of phasing as a way to speed up the recovery of investment costs. It produces an earlier profit in return for a slightly more complex planning process. He urged that the mining companies and the developer be careful to design the mining process to make development more feasible, thus saving money and expanding profits.

DAVID McGEE, of Basalt Rock Company, though unable to attend the conference, had presented his views on the economic needs of the mining company in a short paper that was read for the workshop attendees.

McGee feels it is essential for mining companies to recognize that reclamation of depleted mines and pits is a major consideration in establishing the financial viability of a project. Both reclamation costs and the opportunities associated with land enhancement and second use must be seen as an integral part of the financial planning for mining operations. He warned against ignoring reclamation costs and suggested they be incorporated in budget analyses to show an accurate assessment of a project's net worth. He recommended integrating the implications of the mining plan, local environmental and zoning requirements, and the second use or restoration plan into a cohesive long-range financial projection. This aids the mining company in setting and achieving clear financial goals.

DISCUSSION focused on individual questions relating to the timing of the development project. It was clear that developers saw cash investment as a key issue and that most would prefer not to enter into long-term relationships that demanded heavy capital participation, but would favor giving time and expertise to the creation of plans that could be implemented in the future, while waiting for the final years of a project before beginning to participate in the development costs of the project.

Thoughts in Retrospect

Thoughts in Retrospect

Each participant came to the Productive Second Uses of Mined Land Conference with a different set of perceptions, experiences, and perspectives. A primary goal of the Conference was to stimulate an exchange of ideas among the various interest groups at work in the field of mined-land reclamation and to open up new understandings and ideas for cooperation.

On the last morning of the Conference, four of the participants (each representing a different perspective), were asked to share their perceptions of what had been discussed with other conferees meeting in a plenary session. A lively general discussion followed.

RAY KRAUSS of Homestake Mining Company summarized from the point of view of an environmental planner who is now working within the mining industry, but has extensive experience working for local government in the review of mining plans and long-term plans for sand and gravel extraction for a major Northern California county.

Krauss commented that the conference had confirmed his view that the art of creating second uses on mined land is still in its infancy. It had also confirmed that the idea has the potential to provide something that is for the common good - that is beneficial to the minerals industry and to government and the communities it serves.

He encouraged the mining industry and government to continue to take a creative approach to reclamation and second uses, but commented that he had noticed that even the conferees gathered at Asilomar (whom he regarded as an unusually informed group) found it difficult to discuss "second uses" as a primary topic, preferring to talk in terms of the permit review process with which most were more familiar as a context for reviewing the reclamation potential on mined lands.

Krauss had particularly good words to say for the concept of "art as reclamation", believing that the topic "takes the second use idea to its extreme and forces creative thinking". He saw

the ideas which were shared at the workshop on that topic as most unusual, and felt they could be of significant interest to local agencies and the mineral industry in difficult situations where more conventional approaches (like conversion to development or agriculture) would not readily work.

Krauss urged both the mining industry and government to foster consensus building as a part of their normal review process, creating "win-win" situations instead of the more common "no-win" situations.

GENE BLOCK of CONROCK in Los Angeles, summarized from a mining company's point of view. He stressed the need for "imagination" and "flexibility" in all situations where reclamation is an issue. He encouraged mining companies to look for mixed use solutions wherever possible, rather than taking a simplistic, and often unprofitable, approach.

Block stressed that mining companies do not need to try to be experts on development as well as mining. Knowledge can be acquired through partnerships with developers and others with special expertise, or through consultant advice. Mining should be seen as only one phase of the use of a piece of land. Reclamation to second, third and even fourth uses is likely to occur as part of a logical progression -- very much like the progression which occurs on other land not subject to the mining process.

Finally, Block reminded mining companies that they "have time on their side -- time to work with local government, time to shape the land, time to position your property in the most beneficial way, and time to find the appropriate market situations and the joint venturers needed to bring about the productive second use". He reminded operators that the mind-sets of governmental agencies do change over time. The mining company is in the unusual position of needing to hold its land for long enough periods to see that happen, while, at the same time, earning a good living from the mining process.

Block felt that approval of the initial permit for a mining operation very rarely pivots on the second use proposed. Clear proposals that show the alternatives available for after-use of a mining site could, however, remove some of the apparent uncertainties in the permitting process, making it easier for the local agency to give approval on behalf of the community it serves.

WILLIAM CARTER, President of the National Crushed Stone Association in Washington, D.C., gave the viewpoint of a representative of a national association that represents an important segment of the mining industry. He felt that all sides

of the reclamation and second use issue had been well represented at the conference, except, he felt, that "more could have been heard from environmental groups". He recognized that they , had been a difficult group to identify and interest in the topic of the conference, despite many attempts over a number of months, but felt that a concerted effort should be made by the mining industry in future activities to involve the viewpoint of this very important group.

Carter felt that "all of us are victims of land use regulations -- miners and planners for local government alike. All work under a variety of special interest pressures". He called for more even-handedness in the way regulations are applied, believing that "the process will only be equitable if everybody is subjected to the same requirements".

He stressed that public concern about environmental factors is relatively new and represents a new challenge to the mining industry. Solutions need to respond to the growing demand to build a better quality of life in the communities the industry serves. He encouraged the mining industry to be flexible and to consider, wherever possible, the full range of multiple land uses that might be associated with their operation.

The challenge is to maximize the potential for utilization of the mining product, for the land from which the product comes, and for the second uses to which the land might be converted in the long-term future.

Carter expressed a hope that there would be more meetings similar to the "Productive Second Uses of Mined Land" conference, and expressed a hope that there would be participation in those conferences by a broader cross-section of those with an interest in reclamation and mining land development and conservation from across the entire United States, and even abroad.

TOM PARILO, Assistant Planning Director for Nevada County, California, summed up from the point of view of a representative of a local agency. He indicated that he was encouraged by the interaction that had taken place at the conference. Two of the major interest groups involved in producing and approving second uses of mined land had met and discovered there is a considerable amount of common ground between them. He was pleased that industry and government had finally found a chance to discuss the issues and to recognize their common interest in successful after-use conversion of mined land as one step in their long-term stewardship of the land and its resources.

Parilo expressed his opinion that mining should be thought of as just one of the many uses that can occur on a piece of land.

As such, the mining use must leave the land in good condition for future uses that will occur after mining is complete. Being clear about second uses does not, however, necessarily "sell" a mining project to a local community. Planners and citizens in the local community love controversy and it is the issue of mining as a land use that attracts controversy, not the issue of second use.

Mining companies can no longer use what Parilo calls the "frontier" approach as a buffer against controversy during the permitting process. As a result, it is important that the mining industry educate the public and governmental agencies to their business needs. Such education would actually help the planning process by making it more objective. Industry should also take the time to find out about government's needs and how they conduct their business. They must identify and understand government's role, and then work in that context if they are to hope for early approval of their mining projects.

On the other hand, local government must take the time to identify and map the location of important mineral resources, and set up methods to protect them for future use. Government must also provide for a quick, efficient process for permitting. That will minimize the cost of delay and encourage mining companies to use their best efforts to devise approaches to mining and reclamation that fit the long-term objectives of the local community.

Parilo suggested that mining is a transitional use and "is essentially a borrowing of the land". The best kind of mining use is one which leads toward "development" in the second use and reshapes and enhances the land toward that end.

Successful reclamation has flexibility, is planned well in advance, and is worked into the process from the very beginning. It is also a process that contains appropriate assurances for the after-care of the property once mining is complete.

Parilo expressed his opinion that the conference had provided an excellent forum for dialogue between the various factions involved in the subject of reclamation and second use of mined land, and as such, has been a most valuable activity.

TITO PATRI, landscape architect and former Chairman of the California State Mining and Geology Board, speaking from the audience, also spoke in support of the conference. He pointed out that it was the fulfillment of a dream that had been held by the State's Mining and Geology Board for over five years. Patri felt that there had been a great deal of productive discussion and meeting of minds, but cautioned that "we have just begun to scratch the surface mine".

REG REID of the Bureau of Land Management's office in Sacramento, also speaking from the audience, took the position of a Federal agency involved in mining and reclamation. He felt the mining industry has not been promoting their industry to the public in an effective way, and encouraged industry representatives to join in conferences put on by other disciplines involved in the permitting and reclamation process in order to "get their word out". It was Reid's feeling that the group gathered at the conference was probably well ahead of others in their thinking on the subject, and he expressed the hope that the organizers of the conference and the people gathered there would "keep the momentum going".

PAUL LAWSON, of the State of Oregon, encouraged government and the industry to provide incentives for better reclamation and rewards for those who made a special effort. He pointed to an award that is given annually in the State of Oregon, with judging by a team comprised of representatives of industry and conservation.

Regulatory agencies can hamstring a project or they can work to help and encourage a project to bring out the best solutions possible. Second uses are, more often than not, products of the location and condition of the site, and they should therefore be conceived and reviewed on a site-by-site basis.

Lawson called for dissemination of consistent and technical information to all concerned in the process, and applauded the organizers of the conference for their special efforts in support of the community concerned with reclamation. He made a plea for another conference of a similar kind to happen very soon and hoped that it would involve as large a spectrum as possible of the disciplines involved in land use and reclamation, drawn from as wide a geographical area as possible.

BOB MATTHEWS, lecturer and geologist at the University of California in Davis, made the point that education about mining and the importance of mineral products should start at an early age -- even in grade school. That way, it might be possible to change the attitude of future generations to the need for the important products produced by the minerals industry, broadening understanding and leading to better methodologies in the future.

Matthews underlined the potential role of the media in educating people and getting the word out. He cited the excellent work done for ABC television in Australia, in which a dramatic series focused on the process of mining and its importance to our society.

NORMAN T.GILROY, President of The Institute for the Human Environment, thanked the conferees for a stimulating and productive three days of workshops and showcase sessions.

The conference had shown that mining should be seen as a part of a continuum of land use, and that, though it may take a great deal of time and effort to accomplish the conversion to second uses, the effort will be well worth it. Gilroy stressed that "none of us associated with the mining and reclamation business can do it alone. We need to know where the networks of information and problem solving are, and we need to use them. We need to find ways to get new ideas accepted. This is a world of opportunity, if we know what can be done and what might be accepted".

Gilroy closed by thanking all of those who had helped to make the conference a success (see the Acknowledgments section of these proceedings). He urged conferees to "let the conference organizers know about your successes and your failures" in planning and implementing productive second uses of mined land" He outlined an idea for a working network of people in a variety of disciplines with common interests in reclamation and land use, and outlined briefly a format that might be used to begin the network by connecting the conferees gathered at Asilomar into a lasting network of experts.

TOM GAY, speaking for James F. Davis, California State Geologist (who was not able to attend), expressed his pleasure at the broad mix of people gathered at the conference, and at the sharing of sound and practical ideas that had been generated, many in areas with which many conferees were unfamiliar. He saw the conference as a "bridging" which had reached across the gap between a variety of disciplines and had allowed technical, practical information to flow.

He felt that some valuable perceptions had emerged from the conference, including: a) the idea that mining is an interim use of land and that the mining process can be phased to allow reclamation and second uses to take place gradually; b) reclamation can, if properly planned, be a "value added" benefit to the mining project; c) it is important to remain flexible and to keep many options open in order to maximize the benefits of reclamation over the long life of a mining project; d) special interest groups (like The Trust for Public Land, a participant in the conference) can provide bridges by providing land holding and acquisition services that would otherwise not be available between the private sector and the public; and e) the mining industry can use reclamation and second use as a means to maintain a "good neighbor policy" with the local community.

Gay expressed his feeling that the conference had been a great success. I had allowed conferees from a variety of disciplines

to delve into a great many ways of reclaiming mined land, and it had clearly underlined the feasibility of establishing productive second uses on land subjected to mining if proper attention and planning is given to the reclamation and second use potential from a point as early in the mining process as possible.

Gay thanked the conferees, on behalf of the State of California, for their participation, good humor, and supportive interaction, and formally declared the conference closed.

FIELD TRIP

Agriculture and Recreation as Second Uses in California's Central Valley

FIELD TRIP

Agriculture and Recreation as Second Uses in California's Central Valley

On Tuesday, September 18th, 1984, a group of 19 people participated in a tour of agricultural and recreational reclamation sites in the Central Valley of California. The group, led by Lorraine Van Kekerix of California's Division of Mines and Geology, included members of the Coordinating Committee for Mined Land Reclamation of the Western Land Grant Colleges and Universities, and conference participants from Virginia, California, New Mexico, England, Canada and California.

THE STAMPEDE VALLEY SITE AT CLEMENTS, CALIFORNIA, was the first stop. It consists of 125 acres located just north of the town of Clements on Highway 12. Erv Rifenburg, Construction Manager for Claude C. Wood Company, the mining company active on the site, met the group and explained the mining and reclamation under way there.

Stampede Valley was in agricultural production prior to mining. Farmers grew row crops, peaches and walnuts. Numerous stringers of sand and gravel extended across the alluvial valley from the adjacent Mokelumne River. Farmers had considerable difficulty in obtaining high crop yields because of the differences in quality between the stringers and surrounding soils. The coarse texture, low water holding capacity and nutrient content of the sand and gravel caused low productivity and stunted tree growth on the stringers.

Agriculture is the mainstay of the San Joaquin County economy. In the mid-1950's, the agricultural community initiated a requirement that the mined lands be returned to agriculture when the County issued a permit to mine, and the Stampede Valley Use Permit for mining came under that provision.

Rifenburg described how reclamation of the site proceeds sequentially following the phased mining activity. The piles of overburden and fines are knocked down and allowed to settle for at least one year. The company has determined through experience that allowing five years for settling after grading minimizes the problem of differential settlement, but allowing fines to settle for one year produces satisfactory results when the land is sprinkler irrigated. After the land has settled, its surface is ripped twice, with each pass at right angles to the

other to loosen the material. The land is then graded and leveled before the irrigation system and plantings are installed. The finished grade of the fields is approximately four feet above the high groundwater levels.

One of the landowners who leased mineral rights to the Claude C. Wood Company wanted his land returned to "dead level" for flood irrigation. Problems were experienced in keeping the surface dead level due to differential settling of the overburden after flooding. The company has had to re-level this piece of land three times. There has not been a problem with differential settling, however, on lands which were graded to a 0.3% grade, and are sprinkler irrigated. Flood irrigation has not been successful on reclaimed lands at Stampede Valley.

In the first year following grading, a legume/grain combination such as vetch and barley was planted. In succeeding years, other crops may be planted. Since the reclaimed land is below the level of surrounding lands, cold air settles in the pocket that has been created. The surface air temperature can be four degrees colder than surrounding air in the winter, precluding planting of some crops which are cold- or frost-sensitive. Sprinkler irrigation can, however, be used to raise the air temperatures to allow more cold-sensitive species to be planted.

The Claude C. Wood Company estimates the costs for allowing the fines to settle, leveling, grading, installing sprinkler irrigation and the first year crop were about $18,000 per acre in 1983.

Reclaimed land planted in grapes - Stampede Valley, San Joaquin County, Photo by Lorraine Van Kekerix, Mines and Geology.

THE LOCKEFORD PLANT MATERIALS CENTER (PMC) AT LOCKEFORD, CALIFORNIA, was the second site to be visited. It is located just north of the town of Lockeford on Highway 12, and is operated by the U.S. Department of Agriculture's Soil Conservation Service. Raimond Clary, the PMC manager, explained the Center's activities and led a tour of the facilities.

He presented information on how plants can solve many erosion and other resource problems. The California PMC collects promising plants and tests their performance under a variety

of soil, climatic and use conditions.

The PMC collects plants for testing from several sources, including California collections, other PMC's, foreign countries, and plant breeders and researchers. Some are native or "wild" plants. The PMC does not breed new plant species but tests existing ones for conservation uses.

In over forty years of the California Plant Materials Program, more than 25,000 plants have been tested. Twenty plants have been approved for public use by the Lockeford PMC, in cooperation with the University of California, Davis.

Plant materials research is conducted in cooperation with many State and Federal agencies and organizations, including: the Division of Agricultural Sciences of the University of California; California Department of Transportation; California Department of Forestry; Resource Conservation Districts (RCDs); USDA Forest Service; and the U.S. Army Corps of Engineers.

The Lockeford PMC provides services of benefit to more than 100 million acres in California, including: 10 million acres of crops; 25 million acres of pasture and rangeland; 36 million acres of forests and watersheds; 9 million acres of roads, urban development, railroads, parks and refuges; and 21 million acres of fragile lands, mostly desert. The topography ranges from broad valleys to rolling foothills, upland plateaus and rugged mountains. The elevations range from 278 feet below to 14,400 feet above sea level. Two distinct climates, the Mediterranean and the Continental, combine with the topography and a very complex pattern of soils and elevations to produce many complex plant growth areas. In order to develop plants for conservation in the various plant growth areas, controlled testing is conducted at the PMC and selected field evaluation sites.

Plants are evaluated for conservation uses through a 3-step testing program. Each step takes from two to five years.

Step 1 includes an initial evaluation. Grasses, legumes, forbs, shrubs and trees are planted in 20- to 60-foot rows on the PMC grounds. The plants are rated for seedling vigor, seed production, foliage, and resistance to disease, insects, cold and drought. More than 7,500 plants from approximately 1,500 strains are evaluated each year.

Step 2 is an advanced evaluation. The most promising plants are tried in small plantings at selected sites throughout California. Sites used represent high priority conservation problems and a variety of climatic and soil conditions. Cultural and management techniques also are studied.

Step 3 is the final evaluation. The best plants are tried under actual use conditions. Field planting determines if the grass,

forb, legume, shrub or tree is adapted to the selected use and if it has wide application. Plants are tested on land owned or operated by RCD cooperators and other cooperating organizations. Seed of plants that prove valuable for conservation uses are made available to growers, nurseries, and commercial seed companies. These then sell seeds and plants to the public. It may take 5-10 years from plant collection to the time when a plant is commercially released. For every 5,000 plants tested, only 3 or 4 are released.

The PMC also propagates plants in greenhouses. High quality plants of all types are started from seeds or cuttings at the greenhouse. These are used for initial and advanced testing and for field plantings. Approximately 6,000 shrubs, along with many grasses, legumes and forbs are produced annually at the PMC.

The Plant Materials Committee, composed of SCS staff, prepares the PMC's long-range program and sets its work priorities. High priority is given to Critical Area Stabilization. Disturbed sites such as highway slopes, surface mines, dams, burns, construction sites and timber harvest areas are major sources of sediment. Plants are needed that can quickly grow under adverse conditions. Establishing plants on disturbed areas is difficult. Unnatural soil exposures create establishment problems and the seedbed condition is usually poor, making preparation of an adequate seedbed difficult. Fertilization is essential on most sites because they are infertile, sometimes almost sterile.

Windbreaks are used to control blowing dust, sand and snow, which continue to be serious problems throughout California. Windbreaks create many benefits such as increased crop production, energy conservation, reduced machinery damage, wildlife feed and cover, erosion control and improved air quality. They require fast-growing, long-lived, drought tolerant, dense or compact trees and shrubs suited to the farmstead.

Bank and shoreline stabilization is required along the waterline and upper slope of ditches, ponds and small streams which have a variety of soil conditions and may be dry or wet. Stabilization of channel banks is further complicated by flowing water and fluctuating waterlines. Wave action is a critical erosive force in this problem area.

Low maintenance plants are used for environmental plantings. More needs to be known about the establishment and use of native shrubs and other plants for beautifying our environment. Many of the sites needing such plants are droughty, low in fertility, or unnaturally exposed. Aesthetic plants are desirable for roadbanks, channels, disturbed places and urban areas. These plants must be drought tolerant, able to withstand human abuse, and able to grow on low fertility sites.

Oakwood Lake Resort, Manteca, California, diversified recreational facility on site of an active sand operation, Photo submitted by Oakwood Lake Resort.

THE BROWN SAND COMPANY AND OAKWOOD LAKE RESORT AT MANTECA, CALIFORNIA was the final visit of the day. It is located a few miles west of Manteca, adjacent to Highway 120 and Interstate 5. Chris Stuart, General Manager, and Carla Edwards, Marketing Manager, for Oakwood Lake Resort met the tour group for a picnic lunch in the group picnic area, described the reclamation of the site and operations of the resort, and conducted a tour.

The approximately 360-acre site was in agricultural production prior to mining, and was planted to alfalfa. Because of the San Joaquin County requirement that mine sites be returned to agriculture, considerable time and numerous public hearings were required to obtain a permit to reclaim the site for recreational uses. The Brown family continues to farm the unmined land prior to mining.

The sand mining operation started in 1969. Brown Sand Company produces sands for specialty uses such as plaster, roofing paper, roof tile, golf course greens and traps, gunite, playgrounds, fill, and traction for railroad locomotives. When the mining operation is underway, 8,000-12,000 gallons per minute are pumped from the lake to the adjacent San Joaquin River during the fall, winter and early spring. Most of the water entering the lake is from ground water inflow. Topsoil is stripped before mining and stockpiled for use in revegetation. The area is then mined to the 35-foot depth while it is dry. The sands are processed year-round on-site in three processing plants. Eventually, the area may be mined by dredging below the watertable.

In the spring, the lake is allowed to refill for the resort's heavy use season, June through September. Mining is increasing the lake area by approximately 5 acres per year.

Oakwood Lake Resort opened in 1974. The park is surrounded by rural lands. It includes a 60-acre lake fed by groundwater which is stocked with a variety of fish, and is the site of the largest waterslide complex on the West Coast. It opened in

1974 with one waterslide, and has now been expanded to include ten waterslides. One has a double 360° corkscrew turn, another has a 720° turn, while another simulates the experience of white water innertubing. There is also a "kiddie slide". Oakwood Lake also has the West Coast's only cable water ski system. Skiers can glide along a 3/4-mile loop, from 15 to 40 miles per hour, using an overhead cable supported by five towers. No ski boat is necessary. Other water-based activities include swimming, windsurfing, paddleboating, canoeing and fishing. In the future, sailboating may be available.

The Oakwood Amphitheater features a wide variety of concerts, featuring country and western, contemporary, jazz, swing and blues musicians. The grassed bowl has a 6,000-person seating capacity. The smaller Sunset Amphitheater, with a seating capacity of 500 to 1,300 people, provides a setting for smaller productions, group meetings, rallies, workshops, seminars and lectures. "Brown's Dig" is the resort's indoor/outdoor beer garden, with a big screen television and seating for 300. The outdoor Roller Skating Arena is complete with a speed track. The arena functions not only as a rollerskating rink, but is used for square dancing, ballroom dance competitions, trade shows and other special events. A children's playground, basketball courts, softball fields, arcade rooms, meeting hall, grocery store and snack bars are available on-site. The resorts' catering service operates both on- and off-site, and the group picnic areas can accommodate several thousand people.

The five-star recreational vehicle (RV) campground facilities include 360 RV sites, full hookups, dump stations, tent sites, laundry rooms, and restrooms with hot showers. Organized activities are planned by a Recreation Director. In addition, the resort has a small mobile home park, and a hotel is being considered as part of future developments.

Oakwood Lake Resort staff say the success of the resort is closely tied to the long-range planning done by "Budge" Brown, and his flexibility in changing the plans to meet current market demands. The success of concerts at the site led to development of a 6,000-seat concert facility, and the strong interest of visitors in softball has resulted in more softball fields than originally anticipated. The resort will continue to monitor demand and provide the facilities which draw people to the park.

FIELD TRIP ATTENDEES AT
AGRICULTURAL MINED-LAND RECLAMATION TOUR,
TUESDAY, SEPTEMBER 18, 1984

Intercampus Land Grant Colleges and Universities Western Regional Coordinating Committee Number 21, Mined Land Reclamation

George Garcia
Rocky Mountain Forest and Range Experiment Station
2205 Columbia SE
Albuquerque, NM 87106

David G. Scholl
Rocky Mountain Forest and Range Experiment Station
2205 Columbia SE
Albuquerque, NM 87106

Earl F. Aldon
Rocky Mountain Forest and Range Experiment Station
2205 Columbia SE
Albuquerque, NM 87106

Edie Allen
Institute for Land Rehabilitation
Utah State University
UMC 52
Logan, UT 84322

Ron Ries
USDA Agricultural Research Service
P. O. Box 459
Mandan, ND 58554

Dr. Gary Donart
Crop and Soil Science Dept.
New Mexico State University
Box 3Q
Las Cruces, NM 88003

Gary Halvorson
North Dakota State University
Box 459
Mandan, ND 58554

Burns Sabey
Agronomy Dept.
Colorado State University
Fort Collins, CO 80523

Ardell Bjugstad
Rocky Mountain Forest and Range Experiment Station
South Dakota School of Mines
Rapid City, SD 57701

Robert A. Matthews
Dept. of Geology
University of California
Davis, CA 95616

Other Participants

Dr. Stuart G. McRae
Wye College
University of London
Ashford, Kent TN25 5AH
ENGLAND

John S. Masham
Industrial Minerals
Ministry of Natural Resources
Room 4647, Whitney Block
99 Wellesley Street W.
Toronto, Ontario M7A 1W3
CANADA

Sarah B. Lowe
Property Supervisor
TCG Materials
P. O. Box 1390
Brantford, Ontario N3T 5T6
CANADA

Clement M. Llewellyn, Jr.
Manager, Sand and Gravel Production
Lone Star Cement Inc.
P. O. Box 34527
Richmond, VA 23234

Charles F. Lough
Geologist/Environmental Planner
County of San Diego
Planning Office
5201 Ruffin Rd., Suite B-5
San Diego, CA 92123

Lorraine K. Van Kekerix
Reclamation Specialist
Division of Mines and Geology
610 Bercut Drive
Sacramento, CA 95814

Steve Chainey
Dept. of Agronomy and Range Science
University of California
Davis, CA 95616

Bruce Carswell
Geology Department
University of California
Davis, CA 95616

Dan Graff
Geology Department
University of California
Davis, CA 95616

FIELD TRIP

Development as a Second Use North of San Francisco

FIELD TRIP

Development as a Second Use North of San Francisco

On Saturday, September 22, 1984, fifteen conferees visited three properties in the north San Francisco Bay area where mining sites are being converted to developmental uses. At each site, they were met by key individuals in the managerial or reclamation process who described projects and led the conferees on a tour of the development.

Brickyard Landing, City of Richmond, showing clay quarry before and after development, Photo by Robert L. Buelteman, Jr.

BRICKYARD LANDING, in the East Bay city of Richmond was the first stop. The 39-acre hillside site has been used since the turn-of-the-century to quarry the shale and clay needed for the nearby brickyard, which created building materials used in the construction of the growing city of San Francisco across the Bay. It is now the site for a 241-unit first phase of a condominium residential project by the Innisfree Company. It commands views over an already developed marina and out to the deep water channel serving Richmond Harbor and to San Francisco Bay.

The project is a good example of "after-thought" development of a quarry. The property was mined and used for industrial uses for over sixty years without any real thought to its potential after-use. Steep slopes were left by the quarrying operation, many of which were unstable without remedial work. Most of the surplus material that would be needed for later buttresses or fills had been removed by the quarry. The site was, however, attractive to developers because of its waterfront location and magnificent views over the Bay, and the value of residential units in that part of the region was high enough to offset any remedial work necessary to stabilize and regrade the old quarry site.

MIKE THOMAS, Architect and Vice-President of Mackinlay, Winnacker, McNeil & Associates, and **BOB BINSACCA**, Engineer and Vice-President of A-N West, Civil Engineers for the project, discussed its design using the models and graphic illustrations on display at the project sales office. Thomas demonstrated how a stepped configuration had been used in the design of the building to insure that all residential units would have a view of the Bay. Most have fireplaces and glass enclosed solariums to catch the sun and give shelter from the strong winds off the Bay. The development will be well served with private recreation facilities, including tennis courts, a pool, spa, golf course and exercise facilities. A future phase containing 69 residential units is planned for a site on the hill above. It will be linked with parking and recreation facilities by an inclined elevator.

Thomas and Binsacca demonstrated how the steep slopes of the quarry had been regraded and stabilized with benches at carefully planned intervals to catch surface drainage and minimize erosion. A berm and pad of compacted fill along the base of the hill combined with the concrete rear wall of the garages below the buildings are used ingeniously to create a catchment area to control drainage. It also serves to channel any mud or debris into concrete-lined channels specially designed to carry surface run-off without blocking the drainage ways.

LARKSPUR LANDING in Marin County was the next stop, where a mixed-use development of offices, housing, restaurants, shopping center, hotel, and movie theaters now exists on the site of the former Hutchinson Quarry and Remillard Brickyard, which operated there from the turn-of-the-century until the early 1970's. The quarry produced crushed stone and other construction materials to serve Marin County's rapidly burgeoning development market, playing its part in the growth of the ring of dense suburban development which now virtually surrounds the 104-acre site.

JOHN IGOE of Lincoln Property Company, the developer of the site, and **NORMAN GILROY**, of Norman T. Gilroy & Associates (who originated and planned the conversion project in the early 1970's), briefed the conferees on the development underway there. Larkspur Landing is a site where a developer made the second use profits, not the mining company. The site was acquired by the developer in the mid-1970's after a long public debate in which the decision was made to select the quarry's truck servicing and storage area as the site for the Central Marin Transportation Terminal. Three modern ferries now transport commuters to and from San Francisco, using the old deep water barge loading channel as access to the dramatic spaceframe terminal building.

The site lies at the intersection of the main east-west and north-south highways that link Marin County with the East Bay and San Francisco. The former processing and sales area is now the site of a modern theme shopping center and office complex, and the quarry buildings once used for the filming of the final scenes of "Dirty Harry" have been replaced with an apartment and condominium project that is surrounded by the steep walls of the two quarry bowls cut in the hill. Here, too, Gilroy pointed out, development was an after-thought. Bank stabilization was necessary, and a broad buffer strip of undeveloped land had to be left between the face of the bank and the buildings to protect from falling rocks and sloughing of surface materials. A future phase of the development will see a hotel rising on a central ridge which enjoys magnificent views over San Francisco Bay.

Igoe indicated that the transition from mining site to development use has not always been an easy one. The stabilization work was costly, though major portions of the site had been graded by the quarry to contours which were compatible with later development, particularly in the office and shopping center areas. In some areas, service trenches had to be blasted into the hard-rock surface left by the quarry, an expensive operation which could have been avoided if a blanket of fill had been placed using waste materials generated in the final stages of the quarrying operation.

Larkspur Landing Apartments, Photo by Norman T. Gilroy and Associates

McNEARS QUARRY in San Rafael was the next stop. There, conferees visited Basalt Rock Company's quarrying operation which was operating at full tilt, even on a Saturday. This, too, is a very dramatic waterfront site on which a brickyard has operated since the late 1800's, and where the quarry produces a very high grade man-sized rock and other construction materials for jetties and breakwaters along the Northern California coast and for levee construction in the Sacramento Delta area.

MARVIN LARSEN, plant manager for Basalt Rock Co., and **SCOTT SLOTTERBACK**, project manager for Norman T. Gilroy & Associates (planners for the project), discussed the Mining Plans, Reclamation Plans, and Second Use Plans, for the property, and showed how they are now reflected in the local zoning and long-term General Plan for the area.

McNears Quarry is an example of an operation that has been planned for simultaneous mining and reclamation. The center of the project is a huge quarry bowl which will eventually be excavated in the dry to a depth of 200 feet below the water level of the nearby San Francisco Bay. When mining is complete it will be flooded and turned into a deep water harbor for 650 boats.

The hill to the north of the future harbor is a huge block of rock and shale which is being quarried to produce man-sized rock, crushed rock and asphaltic materials, and to provide the raw materials for brickmaking at the McNears Brickyard. As the hill is taken down, it is being shaped into a series of

stepped planes which will be the site of 350 residential units, each with a clear view across the harbor and out to San Francisco Bay.

The kilns and chimneys of the old brickyard, considered of historic importance by many local residents, will be integrated into an admnistrative professional and service development. Other important land features, such as a large grove of trees and a salt water marsh, will be preserved in their natural state as part of the long-term plan for the property.

On the edge of the McNears project are a great number of $500,000 homes, yet the opposition, from what could have been a vociferous group of local neighbors was minimized by the open discussion that occurred in the reclamation planning process. Slotterback discussed the numerous studies that were done to investigate concerns expressed by the local community. Larsen then discussed a seismic monitoring program which has enabled Basalt to remain a good neighbor to local homeowners concerned with the possible effects of quarry blasting on nearby homes.

After a tour of the operating quarry, the visiting conferees returned to San Francisco, eventually to take the ideas gleaned from the conference and field trip back to home base for use there.

Basalt Rock Company's McNears Quarry and view of San Francisco Bay, Photo by Norman T. Gilroy and Associates

ATTENDEES AT
DEVELOPMENT AS SECOND USE
NORTH OF SAN FRANCISCO
FIELD TRIP
SATURDAY, SEPTEMBER 22, 1984

Anthony Brown, Engineering Geologist
Riverside County Planning Department
4080 Lemon Street, 9th Floor
Riverside, CA 92501

Norman T. Gilroy, President
The Institute for the Human Environment
312 Sutter Street, Suite 608
San Francisco, CA 94108

Fred Grave
Trimount
1935 Parkway
Everett, MA 02149

Louis Guyott
Trimount
1935 Parkway
Everett, MA 02149

Dr. Peter Langkamp
Shell Australia
P. O. Box 872 K
Melbourne 3001
AUSTRALIA

Clement Llewellyn
Lone Star Cement Inc.
Post Office Box 34527
Richmond, VA 23234

Charles Lough
San Diego County
Department of Planning and Land Use
5201 Ruffin Road, Suite B-5
San Diego, CA 92123

Sarah B. Lowe, Supervisor
Property Supervisor
TCG Materials Limited
Post Office Box 1390
Brantford, Ontario N3T 5T6
CANADA

John S. Masham
Aggregate Enforcement Policy Advisor
Industrial Minerals Section
Ontario Ministry of Natural Resources
Room 4647, Whitney Block
99 Wellesley Street West
Toronto, Ontario M7A 1W3 CANADA

Scott Slotterback
The Institute for the Human Environment
312 Sutter Street, Suite 608
San Francisco, CA 94108

Leonardo H. Suzio, Vice-President
York Hill Trap Rock Quarry Company
Post Office Box 748
Westfield Road
Meriden, CT 06450

AN EMERGING NETWORK

A Reference Guide to Conference Participants

A Reference Guide to Conference Participants

The Productive Second Uses of Mined Land conference brought together an unusual group of talented and well-informed individuals from a wide variety of disciplines associated with reclamation of mined lands and land use in general. Each conferee enjoyed a rare opportunity for an active exchange of knowledge. For many it was a chance to develop an understanding of other points of view and the ways in which other areas of specialty might be used to enhance the potential of reclamation projects to be undertaken at "home bases".

The conferees gathered at Asilomar are a powerful group who could represent the beginning of an emerging network that is capable of:

- assisting with problem solving,
- identifying Case Studies and successful methods and approaches,
- providing access to experts working in other allied disciplines,
- cutting red tape by allowing direct access to people and information that might otherwise not be readily available,
- providing access to the trusted networks of information and expertise of each of the other conferees.

Each conferee is a potential "tip of a network", with organizational and professional contacts and access to newsletters, data sources, association memberships, etc. By linking conferees together, the network created at Asilomar has the potential of becoming a "network of networks" that stretches all the way from Australia, across North America, to Europe!

In order to identify and describe the network that began to emerge at Asilomar, we have provided on the pages that follow, listings that show:

- the name and professional association of each conferee,

- a short description of what each does and their areas of special interest,
- an indication of the discipline in which each works,
- information to facilitate easy contact.

All information presented here is current as of September 25, 1984, the date of the Asilomar conference. It is based upon the data provided to us by the conferees themselves on their registration cards.

Networks are delicate things. With use and interest, they survive and serve us well. Without use, they soon become stale and out-of-date and die. We hope that you will use, and expand upon, the beginnings here and keep the network alive and dynamic. Network listings will be kept on file in the computer at The Institute for the Human Environment in San Francisco, and they will be updated as new information comes in. If there is important information that you feel should be added to the short summary presented about you here, please write to The Institute for the Human Environment, at 312 Sutter Street, Suite 608, San Francisco, CA 94108, and let us know so that we can update your record.

Dr. Earl F. Aldon has been involved for many years in the reclamation of coal mine spoils in the Southwest, particularly in the establishment of four wing salt bush on disturbed areas. He is active with the American Society for Surface Mining and Reclamation.

Role: Federal Government, Revegetation, Forestry

Contact Information: Rocky Mountain Forest and Range Experiment Station
2205 Columbia SE
Albuquerque, NM 87106
(505) 766-2384

John Alfors is a Supervising Geologist for the California Department of Conservation's Division of Mines and Geology and Supervisor of the Surface Mined-Lands Reclamation Program.

Role: State Government

Contact Information: Division of Mines and Geology
California Department of Conservation
610 Bercut Avenue
Sacramento, CA 95814
(916) 322-2562

Robert Anderson is the Division Chief of Mineral Resources for the Bureau of Land Management's California State Office. He oversees mining, and mineral exploration and development on Federal lands within California, including the determination of appropriate royalties for their use.

Role: Federal Government

Contact Information: Bureau of Land Management
2800 Cottage Way
Sacramento, CA 95825
(916) 484-4821

Shelley Arrowsmith is a staff member and Project Manager for The Institute for the Human Environment. She served as Conference Registrar and Graphic Chronicler for the Productive Second Uses of Mined Land Conference.

Role: Conference Staff

Contact Information: The Institute for the Human Environment
312 Sutter Street, Suite 608
San Francisco, CA 94108
(415) 956-1230

Thor Bailey is the President of Energy Production, a private firm specializing in biomass energy conversion and fuelwood forestry.

Role: Consulting, Revegetation, Forestry

Contact Information: Energy Production
2505 Esplanada #5
Chico, CA 95926
(916) 893-0330

David J. Beeby, a Senior Geologist for the California Department of Conservation's Division of Mines and Geology, is Program Manager of the State's Urban SMARA Program.
Role: State Government, Geology
Contact Information: Division of Mines and Geology
Department of Conservation
610 Bercut Avenue
Sacramento, CA 95814
(916) 323-8562

Dr. Ardell J. Bjugstad is the Laboratory Director for the Forest Service Research Station in Rapid City, South Dakota, in charge of the reclamation of surface mined areas of the Northern Great Plains. Projects primarily involve the treatment of spoils from coal, uranium, bentonite clay and gold mining, as well as the reclamation of drill pad sites and salt spills due to oil development.
Role: Federal Government
Contact Information: United States Department of Agriculture
Forest Service Research
South Dakota School of Mines
Rapid City, SD 57701
(605) 343-0811

Eugene Lou Blanck is an engineering geologist responsible for the review of mining and reclamation plans for San Bernardino County, a territory which includes one-quarter of all the mining operations in California.
Role: Local Government, Geology
Contact Information: Environmental Public Works Agency
Land Management Department
Office of Building and Safety
385 North Arrowhead Avenue, 1st Floor
San Bernardino, CA 92415
(714) 383-3823

Martha Blane, a horticulturist for S & S Seeds, is a specialist in seed selection for erosion control, landscape use, and reclamation. She can provide site specific and special seed collections upon request.
Role: Consulting, Revegetation
Contact Information: S & S Seeds
Post Office Box 4093
San Marcos, CA 92069
(619) 756-1347

Gene Block is Vice-President and Properties Manager of CONROCK Company, a large, multi-faceted mining company in Southern California. He is responsible, in part, for the reclamation of the company's depleted sand and gravel sites.
Role: Mining Industry
Contact Information: CONROCK Company
3200 San Fernando Road
Los Angeles, CA 90065
(213) 258-2777

Don Blubaugh, the Director of the California Department of Conservation, has overall responsibility for implementing SMARA, California's Surface Mining and Reclamation Act.
Role: State Government
Contact Information: Department of Conservation
1416 Ninth Street
Sacramento, CA 95819
(916) 322-1080

Ransom Bratton III, a Planner in the Planning and Development Office of Santa Clara County, is Staff Coordinator for the Surface Mined Land Reclamation Program, reviewing all surface mining applications.
Role: Local Government
Contact Information: Santa Clara County
Planning and Development Office
East Wing, County Gov't Center
70 West Hedding
San Jose, CA 95110
(408) 299-2512

Joe Breceda is a Councilman for the City of Irwindale, a city which presently has over 700 acres of active quarrying and 100 to 150 acres to be reclaimed to second uses in the near future.
Role: Local Government
Contact Information: City of Irwindale
15847 Hidalgo Street
Irwindale, CA 91706
(818) 962-3381

C. Eugene Brock is a Forest Service Officer presently in charge of major mining proposals in his area.
Role: Federal Government, Forestry
Contact Information: United States Department of Agriculture
Forest Service
Post Office Box 228
Gasquet, CA 95543
(707) 457-3131

Anthony Brown, an Engineering Geologist for the Riverside County Planning Department, is in charge of processing surface mining permits in his county.
Role: Local Government
Contact Information: Riverside County Planning Department
4080 Lemon Street, 9th Floor
Riverside, CA 92501
(714) 787-2268

Larry Brown is the Deputy Director of Environmental Control for AMAX, Inc., responsible for reclamation planning and implementation, along with other environmental concerns.
Role: Mining Industry, Planning
Contact Information: AMAX, Inc.
1707 Cole Boulevard
Golden, CO 80401
(303) 231-0228

Dr. Elizabeth L. Buchanan is in charge of special projects for Davey Environmental Services, including lake and watershed management and revegetation schemes.
Role: Consulting, Revegetation
Contact Information: Davey Environmental Services
117 S. Water
Kent, OH 44240
(800) 321-7572

Richard Buckberg works for Circuit Rider Productions, specialists in revegetation, erosion control, and wildlife assessment and mitigation.
Role: Consulting, Revegetation
Contact Information: Circuit Rider Productions
9619 Old Redwood Highway
Windsor, CA 95492
(707) 838-6641

Harriet Burgess is Vice-President and Washington Government Liaison for The Trust For Public Land, a highly effective national land conservation organization that works closely with both private land owners and government agencies.
Role: Conservation
Contact Information: The Trust for Public Land
82 Second Street
San Francisco, CA 94105
(415) 495-4014

John Busterud, a lawyer and environmental consultant, has held several environmental posts with the Federal government, including Chairman of the President's Council on Environmental Quality. Mr. Busterud also teaches Negotiation Settlement and Environmental Conflict Management at Hastings Law School and the Duke University School of Forestry and Environmental Studies, and is the former President of RESOLVE, Center for Environmental Conflict Resolution.
Role: Consulting, Law
Contact Information: Ecology & Environment, Inc.
60 Hamilton Court
Palo Alto, CA 94301
(415) 777-2811

William M. Calvert is a civil engineering consultant who develops reclamation plans for mining companies, provides guidance through the permitting sequence, and helps the client get the operation underway.
Role: Consulting, Engineering
Contact Information: Bissell and Karn, Inc.
2551 Merced Street
San Leandro, CA 94577
(415) 483-2170

Denton W. Carlson is the Staff Director for the Minerals Area Management Staff in the Pacific Southwest National Forest Region.
Role: Federal Government, Forestry
Contact Information: Mineral Area Management Staff
Pacific Southwest Region
United States Forest Service
630 Sansome Street
San Francisco, CA 94115
(415) 556-9765

Greg Carr is a Planner for the Sonoma County Planning Department, in charge of local government review of reclamation plans and mining permit applications.
Role: Local Government
Contact Information: Sonoma County Planning Department
575 Administration Drive, Room 105-A
Santa Rosa, CA 95401
(707) 527-3689

William L. Carter is the President of the National Crushed Stone Association, a national association of mining companies. He serves as a government liaison, industry information resource, and promoter of industry activities.
Role: Mining Industry, Education
Contact Information: National Crushed Stone Association
1415 Elliot Place N.W.
Washington, DC 20007
(202) 342-1100

Gil Castle is Vice-President of Comarc Systems, a private consulting firm involved in the use of computer graphics for contour modeling, view analysis and environmental evaluation of reclamation and planning proposals.
Role: Consulting, Computers
Contact Information: Comarc Systems
150 Executive Park Boulevard
San Francisco, CA 94134
(415) 467-1300

Steve Chainey is a landscape architecture student at U.C. Davis, specializing in revegetation.
Role: Student, Revegetation
Contact Information: 2116 Espana Court
Davis, CA 94616
(916) 758-3819

Peter Chamberlin is a Planner, in charge of environmental review for the Tuolumne County Planning Department.
Role: Local Government
Contact Information: Tuolumne County Planning Department
2 S. Green Street
Sonora, CA 95370
(209) 533-5611

Leonard Charles is the principal of Leonard Charles and Associates, a consulting firm that prepares Environmental Impact Reports for mining projects in California's Sierra Mountain area.

Role: Consulting, EIR'S

Contact Information: Leonard Charles and Associates
58500 Bohan-Dillon Road
Cazadero, CA 95421
(707) 847-3480

Ken Cole is a Reclamation Specialist and Engineering Geologist with the California Department of Conservation's Division of Mines and Geology and is responsible for the review of engineering geology aspects of California's Reclamation Program.

Role: State Government, Geology, Planning

Contact Information: Division of Mines and Geology
Department of Conservation
610 Bercut Avenue
Sacramento, CA 95814
(916) 322-9995

Tim Collins is a mining company executive with a background in investment banking and a specialty in financing and analyzing mining companies. Mr. Collins also maintains an active interest in art and has been a patron of Robert Smithson and his earth sculpture projects.

Role: Mining Industry, Arts

Contact Information: United Mining Corporation
Post Office Box 370
Virginia City, NV 89440
(702) 847-0334

Steve Costa is President of the Bay Area Partnership, a non-profit network of private, public, and non-profit organizations concerned with the quality of life in cities. He is experienced in project development and finance in the public sector, particularly in the enhancement of the quality of life in urban areas.

Role: Public Interest

Contact Information: Bay Area Partnership
337 - 17th Street, Room 206
Oakland, CA 94612
(415) 763-8447

Peter H. Cotter is the Resource Manager and Geologist for Lone Star Industries, Inc., a large mining company with holdings throughout the United States. He is responsible for the development of mining and reclamation plans.

Role: Mining Industry, Geology

Contact Information: Lone Star Industries, Inc.
Post Office Box 5252
Pleasanton, CA 94566
(415) 463-1420

Don Crescelius is the Supervisor of Regulatory Affairs for Nerco Mining Company, in charge of analyzing proposed and existing regulations and assessing their impact on the company's mining operations.
Role: Mining Industry
Contact Information: Nerco Mining Company
Post Office Box 4000
(Sheridan, WY 82801
(307) 672-0451, ext. 409

Greig S. Cummings performs agency review of reclamation plans for the San Luis Obispo County Planning Department in California.
Role: Local Government
Contact Information: San Luis Obispo County Planning Dept.
County Government Center
San Luis Obispo, CA 93408
(805) 549-5600

Nancy Dakin is a graduate student in urban and environmental planning at U.C. Berkeley. She has a special interest in land reclamation and is a staff member of The Institute for the Human Environment.
Role: Student, Planning
Contact Information: 11 El Camino Real
Berkeley, CA 94705
(415) 956-1230

Jim Darden is responsible for engineering, planning, and implementing the surface and underground mine reclamation projects for Alabama Bi-Products, the largest coal company in Alabama, which reclaimed over 400 acres of land in 1983.
Role: Mining Industry, Engineering, Planning
Contact Information: Alabama Bi-Products
Post Office Box 10246
Burmingham, AL 35202
(205) 250-5434

Walter Davidson is a Research Forester specializing in surface mine reclamation and containerized planting.
Role: Federal Government, Revegetation, Forestry
Contact Information: United States Department of Agriculture
Forest Service
Post Office Box 152
Princeton, WV 24740
(304) 425-8106

G. Thomas Davis, Environmental Group Manager for Born, Barrett & Associates, is responsible for the preparation of reclamation plans as a consultant to the aggregate industry.
Role: Consulting, Planning
Contact Information: Born, Barret & Associates
1200 Quail St., Suite 260
Newport Beach, CA 92660
(714) 833-9213

David G. DeVries does work in reclamation planning and reclamation monitoring for the consulting firm of Hammon, Jensen, Wallen & Associates.
Role: Consulting, Planning
Contact Information: Hammon, Jensen, Wallen & Associates
8407 Edgewater Drive
Oakland, CA 94621
(415) 638-6122

Rick Deery, a Geologist for the Bureau of Land Management in Washington, D.C., oversees the application of surface mine management regulations under the Mining Law Administration Program of the Mining Law and Saleable Minerals Division.
Role: Federal Government, Geology
Contact Information: Bureau of Land Management
Code 680, Carrier Building
18th & C Street, NW
Washington, DC 20240
(202) 343-8537

Richard DeJesus is a consultant with Foothill Planning Associates and is responsible for reclamation plans for mining company clients.
Role: Consulting, Planning
Contact Information: Foothill Planning Services
Post Office Box 2461
Grass Valley, CA 95945
(916) 273-8941

Norm Dietrich is an engineer and landscape architect for Martin Carpenter and Associates. He has previously taught courses in mined land reclamation at Texas A & M and U.C. Berkeley.
Role: Consulting, Engineering
Contact Information: Martin Carpenter and Associates
1640 Laurel
San Carlos, CA 94070
(415) 493-4372

Barbara Evoy is an Assistant Geologist specializing in hydrology for the California Department of Conservation's Division of Mines and Geology, and is responsible for providing technical expertise in the State's Reclamation Program.
Role: State Government, Hydrology
Contact Information: Division of Mines and Geology
Department of Conservation
610 Bercut Avenue
Sacramento, CA 95814
(916) 323-8568

Linda A. Falasco, is the Administrative Assistant for the Los Banos Gravel Group and is President of the Central Valley Rock, Sand and Gravel Association in California, where she works in a legislative advocacy capacity at the county and state level.

Role: Mining Industry

Contact Information: Los Banos Gravel Group
Post Office Box 1111
Los Banos, CA 93635
(209) 826-5066

Paula Fink works for the National Crushed Stone Association in Washington, encouraging industry reclamation activities through the Association's ABOUT FACE Program and acting as an industry information resource.

Role: Mining Industry, Education

Contact Information: National Crushed Stone Association
1415 Elliot Place, NW
Washington, DC 20007
(202) 342-1100

John J. Fitz-Gerald is the General Counsel for the Gold Fields Mining Corporation in Colorado.

Role: Mining Industry, Law

Contact Information: Gold Fields Mining Corporation
200 Union Boulevard, Suite 500
Lakewood, CO 80228
(303) 988-0360

Thomas Ford is an Environmental Specialist for the National Park Service in Death Valley National Monument. He assesses the impact of proposed mining operations on the natural and cultural resources of the desert environment area and reviews reclamation plans.

Role: Federal Government

Contact Information: Death Valley National Monument
Death Valley, CA 92328
(619) 786-2371

Jonathon Foster is a Landscape Architect with the Bureau of Land Management in Ukiah. As District Visual Resources Protection Lead, he makes field examinations for environmental protection, resource conservation, and reclamation of lands.

Role: Federal Government

Contact Information: Bureau of Land Management
Post Office Box 940
Ukiah, CA 95482
(707) 462-3873

Alcides Freitas is the Environmental Coordinator for Sacramento County and is in charge of environmental review, including mining permits. He is also a member of the State Mining and Geology Board, which is responsible for policy level implementation of California's Surface Mining and Reclamation Act

Role: State Government, Local Government

Contact Information: Sacramento County Planning Department
827 Seventh Street, Room 101
Sacramento, CA 95814
(916) 322-1082

Don Friend has a B.S. from U.C. Berkeley in Conservation of Natural Resources, and served as a facilitator at the Productive Second Uses Conference.

Role: Conference Staff

Contact Information: 2909 Regent Street #3
Berkeley, CA 94705

Bill Gay, is a Project Manager for The Trust For Public Land, a national land conservation organization, and has been responsible for several reclamation projects involving agriculture and wildlife uses.

Role: Conservation

Contact Information: The Trust for Public Land
82 Second Street
San Francisco, CA 94105
(415) 495-5660

Tom Gay is the Chief Deputy State Geologist for the State of California Department of Conservation's Division of Mines and Geology.

Role: State Government

Contact Information: Division of Mines and Geology
Department of Conservation
1416 - 9th Street #1341
Sacramento, CA 95814
(916) 322-4149

Michael Gersick is an Administrative Advocate for the firm of Grattan/Gersick/Karp, a governmental relations consulting firm specializing in environmental land use and energy issues as they occur in the planning, regulatory and administrative processes.

Role: Consulting, Planning, Law

Contact Information: Grattan/Gersick/Karp
1009 - 14th Street
Sacramento, CA 95814
(916) 433-0191 Sacramento
(415) 974-6047 San Francisco

Paul Gesso is the Real Estate Manager for Cooley Gravel Company in Colorado. He is in charge of all the company's land holdings, developing re-use projects and overseeing their reclamation programs.

Role: Mining Industry

Contact Information: Cooley Gravel Company
Post Office Box 5485 TA
Denver, CO 80217
(303) 697-1401

Norman T. Gilroy is the principal of Norman T. Gilroy and Associates, consultants in land planning, reclamation, and environmental design. He also serves as President of The Institute for the Human Environment, one of the joint sponsors of this conference.

Role: Consulting, Planning, Conference Staff

Contact Information: Norman T. Gilroy and Associates
312 Sutter Street, Suite 608
San Francisco, CA 94108
(415) 956-1230

Gail M. Goldman administers Colorado's Art in Public Places Program, working with the Bureau of Land Reclamation on second use development. She was formerly a Grants Officer for the Design Arts Program of the National Endowment for the Arts in Washington, D.C.

Role: Arts

Contact Information: Colorado Council on the Arts and Humanities
770 Pennsylvania Street
Denver, CO 80203
(303) 866-2610

Robert A. Good is the President and General Manager of Kaiser Sand and Gravel, a large mining company. He is in charge of policy decisions which guide the development of mining and reclamation plans for his company.

Role: Mining Industry

Contact Information: Kaiser Sand & Gravel
Post Office Box 580
Pleasanton, CA 94566
(415) 846-8800

Fred Grave is involved in the purchasing and sale of liquid asphalt and is active in real estate development for the Guyott Company, the parent company of Trimount.

Role: Mining Industry

Contact Information: The Guyott Company
c/o Trimount
1935 Parkway
Everett, MA 02149
(617) 387-3100

Louis Guyott is the treasurer of Trimount and involved in real estate development in the Boston area.
Role: Land Use, Development
Contact Information: Trimount
1935 Parkway
Everett, MA 02149
(617) 387-3100

David Hallock is involved in the planning and review of reclamation projects for Boulder County Parks and Open Space in Colorado.
Role: Local Government
Contact Information: Boulder County Parks and Open Space
Post Office Box 471
Boulder, CO 80302
(303) 441-3950

John J. (Jack) Heck is a member of the California State Mining and Geology Board and is the Chairman of its Reclamation Subcommittee. He was formerly Mamager of Engineering and Maintenance for Kaiser Sand and Gravel Company in California and worked with them on a number of reclamation projects.
Role: Mining Industry, State Government
Contact Information: State Mining and Geology Board
186 Estates Drive
Danville, CA 94526
(916) 322-1082

Michael Heinzen is the Division Head of the Tulare County Building and Planning Department in California, overseeing the review and processing of surface mining permits and reclamation plans.
Role: Local Government
Contact Information: Tulare County Building and Planning Department
Tulare County Civic Center
Visalia, CA 93291
(209) 733-6169

Robert Helmick is in charge of reviewing mining and reclamation plans for Boulder County, Colorado.
Role: Local Government
Contact Information: Boulder County
Post Office Box 471
Boulder, CO 80306
(303) 441-3930

John Hickman is the Manager of Land and Resources for Mobile Premix Concrete of Denver, Colorado, and is in charge of the planning, development, and implementation of reclamation plans.
Role: Mining Industry
Contact Information: Mobile Premix Concrete
Post Office Box 5183 TA
Denver, CO 80217
(303) 534-3165

Don Blubaugh, the Director of the California Department of Conservation, has overall responsibility for implementing SMARA, California's Surface Mining and Reclamation Act.
Role: State Government
Contact Information: Department of Conservation
1416 Ninth Street
Sacramento, CA 95814
(916) 322-1080

Ransom Bratton III, a Planner in the Planning and Development Office of Santa Clara County, is Staff Coordinator for the Surface Mined Land Reclamation Program, reviewing all surface mining applications.
Role: Local Government
Contact Information: Santa Clara County
Planning and Development Office
East Wing, County Gov't Center
70 West Hedding
San Jose, CA 95110
(408) 299-2512

Joe Breceda is a Councilman for the City of Irwindale, a city which presently has over 700 acres of active quarrying and 100 to 150 acres to be reclaimed to second uses in the near future.
Role: Local Government
Contact Information: City of Irwindale
15847 Hidalgo Street
Irwindale, CA 91706
(818) 962-3381

C. Eugene Brock is a Forest Service Officer presently in charge of major mining proposals in his area.
Role: Federal Government, Forestry
Contact Information: United States Department of Agriculture
Forest Service
Post Office Box 228
Gasquet, CA 95543
(707) 457-3131

Anthony Brown, an Engineering Geologist for the Riverside County Planning Department, is in charge of processing surface mining permits in his county.
Role: Local Government
Contact Information: Riverside County Planning Department
4080 Lemon Street, 9th Floor
Riverside, CA 92501
(714) 787-2268

Larry Brown is the Deputy Director of Environmental Control for AMAX, Inc., responsible for reclamation planning and implementation, along with other environmental concerns.
Role: Mining Industry, Planning
Contact Information: AMAX, Inc.
1707 Cole Boulevard
Golden, CO 80401
(303) 231-0228

Ginger Kaldenbach is a Physical Scientist and the Project Manager in charge of the reclamation of abandoned coal mines for Colorado's Office of Surface Mining in Denver.
Role: State Government
Contact Information: Office of Surface Mining
1020 - 15th Street
Denver, CO 80202
(303) 844-5918

George Kenline is a Lands Officer for the U.S. Forest Service, in charge of mining claims and special use permits. His specialty is in tree horticulture and reforestation.
Role: Federal Government, Forestry
Contact Information: United States Forest Service
Post Office Box 290
Fawnskin, CA 92333
(714) 866-3437

Paul Klite is a sculptor, scientist, and activist, presently a consultant to the State of Colorado in charge of the development of a state mechanism for funding aesthetic solutions to mine reclamation.
Role: Consulting, Arts
Contact Information: 1450 Logan Street
Denver, CO 80203
(303) 832-7558

Cherie Kluesing is an Assistant Professor at the Graduate School of Design of Harvard University and a partner and landscape architect with the Walker Design Group in Belmont, Massachusets. She is the author of Reclamation Works: An Aesthetic Approach to Land Reclamation.
Role: Education, Consulting, Arts, Planning
Contact Information: Harvard University
Graduate School of Design
48 Quincy Street
Cambridge, MA 02138
(617) 459-2651

Rosemary J. Koberlein is the Regional Operations Manager for Davey Environmental Services in Walnut Creek, consulting in forestry revegetation.
Role: Consulting, Revegetation, Forestry
Contact Information: Davey Environmental Services
1990 North California Boulevard
Suite 830
Walnut Creek, CA 94596
(415) 933-7733

Muriel Koven is the Assistant Planner for the Sacramento County Planning Department. She reviews mining reclamation plans.
Role: Local Government
Contact Information: Sacramento County Planning Dept.
827 - 7th Street, Room 230
Sacramento, CA 95814
(916) 440-7783

Ray E. Krauss is the Project Environmental Manager for Homestake Mining Company, with responsibility for security planning approvals for the McLaughlin Project, a large mining operation that spans several counties. He also worked as a Planner for Sonoma County in California during the development of the County's Aggregate Resources Management Plan.
Role: Mining Industry, Planning
Contact Information: Homestake Mining Company
Post Office Box 1010
Lower Lake, CA 95457
(707) 995-1172

Dr. Peter Langkamp is the Environmental Advisor for Resources for the Coal Division of the Shell Company of Australia, Limited.
Role: Mining Industry, Environmental Impact
Contact Information: Shell Australia
P. O. Box 872 K
Melbourne 3001
AUSTRALIA
(03) 609-5857

Paul F. Lawson is the Supervisor for Mined Land Reclamation for the State of Oregon.
Role: State Government
Contact Information: Mining Land Reclamation
State of Oregon
Department of Geology & Mineral Industries
1129 S.E. Santiam Road
Albany, OR 97321
(503) 967-2039

John Lehman is Vice-President and Director of Community Relations for John Sexton Contractors, land-fill developers with experience in end-use (second use) and redevelopment of clay pits and limestone quarries. Past projects have included conversion to condominiums, commercial uses, cemetaries and parks.
Role: Consulting
Contact Information: John Sexton Contractors
1815 South Wolf Road
Hillside, IL 60162
(312) 449-1250

Eddie Leivas is an Associate Geologist for the California Department of Conservation's Division of Mines and Geology in the Urban Mineral Land Classification Program.
Role: State Government, Geology
Contact Information: Division of Mines and Geology
Department of Conservation
610 Bercut Avenue
Sacramento, CA 95814
(916) 322-9301

Clement Llewellyn is the Manager of Virginia sand and gravel operations for Lone Star Cement, Inc., which reclaimed over 100 acres of mined land in 1984. He also serves on the Virginia Board of Surface Mining, a non-judiciary Board set up to mediate between the State and mine operators.
Role: Mining Industry
Contact Information: Lone Star Cement Inc.
Post Office Box 34527
Richmond, VA 23234
(804) 275-1446

Charles Lough is in charge of reviewing major use permits and reclamation plans for the San Diego County Department of Planning and Land Use.
Role: Local Government
Contact Information: Department of Planning and Land Use
San Diego County
5201 Ruffin Road, Suite B-5
San Diego, CA 92123
(714) 565-5574

Sarah B. Lowe, Property Supervisor for TCG Material Limited in Canada, plans and implements progressive rehabilitation of the company's sand and gravel pits. TCG sites include recreational, conservation, agricultural and industrial after-uses, although the main emphasis is currently on agriculture.
Role: Mining Industry
Contact Information: TCG Materials Limited
Post Office Box 1390
Brantford, Ontario N3T 5T6
CANADA
(519) 753-3408

Ralph Loyd, an Associate Geologist for the California Department of Conservation's Division of Mines and Geology in the Non-Urban Mineral Land Classification Program of the California Surface Mined Land Reclamation Act.
Role: State Government, Geology
Contact Information: Division of Mines and Geology
Department of Conservation
610 Bercut Avenue
Sacramento, CA 95814
(916) 322-9207

Zoe Mankoski is the Program Manager for the California Department of Conservation's Division of Mines and Geology Surface Mined Land Reclamation Program, which uses a multi-disciplinary approach to the review of Reclamation Plans. The Reclamation Plan group serves as a technical advisor to both local government and the mining industry.
Role: State Government, Planning
Contact Information: Division of Mines and Geology
Department of Conservation
610 Bercut Avenue
Sacramento, CA 95814
(916) 323-8565

Kathy Martinez is the Administrative Assistant for Oakwood Lake Resort in Manteca, California, and is involved in recreational development for the former quarry site.
Role: Land Use, Recreation
Contact Information: Oakwood Lake/Brown Sand
874 E. Woodward Avenue
Manteca, CA 95336
(209) 239-4929

John S. Masham is the Aggregate Enforcement Policy Advisor for the Industrial Minerals Section on the Ontario Ministry of Natural Resources in Canada. His role is in government policy and legislation as it relates to mined land.
Role: State Government
Contact Information: Ontario Ministry of Natural Resources
Room 4647, Whitney Block
99 Wellesley Street West
Toronto, Ontario M7A 1W3 CANADA
(416) 965-3127

Fred S. Matter is a Professor of Architecture at the University of Arizona. He teaches environmental planning, is the coordinator of the Graduate Program. He is the author of A Balanced Approach to Resource Extraction and Creative Land Development.
Role: Education, Planning
Contact Information: College of Architecture
University of Arizona
Tucson, AZ 85740
(602) 621-6755

Robert A. Matthews is Senior Lecturer for the Department of Geology at the University of California, Davis, and a member of California's State Mining and Geology Board.
Role: Education, Geology, State Government
Contact Information: Department of Geology
University of California, Davis
1141 Fordham
Davis, CA 95616
(916) 752-0179

Dr. Stuart McRae is a Lecturer in Land Resources Science at Wye College in England, specializing in the practical use of soil survey information in land use planning. He is a well known consultant to the British sand and gravel industry in the agricultural restoration of former quarries and surface mining operations.

Role: Education, Consulting, Planning

Contact Information: Dept. of Environmental Studies
and Countryside Planning
WYE College (University of London)
Ashford, Kent TN25 5AH
ENGLAND

Edward S. "Doc" Merrill is an attorney specializing in real estate development for the firm of McCutcheon, Doyle, Brown & Enersen.

Role: Consulting, Development

Contact Information: McCutcheon, Doyle, Brown & Enersen
Three Embarcadero Center
San Francisco, CA 94111
(415) 393-2000

Steve Millay is an Assistant Planner with the Trinity County Planning Department in Northern California, administering special use permits and applying surface mining and reclamation regulations. His background is in natural resource planning and interpretation.

Role: Local Government

Contact Information: Trinity County Planning Dept.
Post Office Box 936
Weaverville, CA 96093
(916) 623-4000, ext. 351

Russ Miller is an Associate Geologist for the California Department of Conservation's Division of Mines and Geology in the Urban Mineral Lands Classification Program under the California Surface Mining and Reclamation Act.

Role: State Government, Geology

Contact Information: Division of Mines and Geology
Department of Conservation
28 Civic Center Plaza #642
Santa Ana, CA 92701
(714) 558-4187

Pat Miranda is a Councilman for the City of Irwindale, a city in Southern Calfornia which presently has over 700 acres of active quarrying and 100 to 150 acres to be reclaimed to second uses in the near future.

Role: Local Government

Contact Information: City of Irwindale
15829 Hidalgo Street
Irwindale, CA 91706
(818) 962-3381

John Moon has a background as a mining engineer and spent many years in the administration of Federal mining law. He now heads a consulting firm which deals with public land and mineral issues, facilitating the permitting process, preparing environmental reports, and securing approvals of plans of operation.

Role: Consulting, Planning

Contact Information: Public Resources Associates
2236 Shaw Street
Sacramento, CA 95821
(916) 924-8786

Catherine Munson is President of Lucas Valley Properties in San Rafael, California and a real estate broker and investor with property interests in Northern California and the Palm Springs area.

Role: Land Use, Development

Contact Information: Lucas Valley Properties Inc.
4174 Redwood Highway
San Rafael, CA 94903
(415) 479-1000

Patrick G. Nevis works in marketing for Brown & Caldwell, a California civil engineering firm which designs and evaluates water quality monitoring programs and assists with permitting. The firm specializes in mine drainage, hazardous waste and pollution abatement, and is presently working on the Leviathan Mine Drainage Project, the largest project of its kind in California.

Role: Consulting, Engineering

Contact Information: Brown & Caldwell
723 "S" Street
Sacramento, CA 95814
(916) 444-0123

David Nunenkamp is the Vice-President and General Manager for California Nickel Corporation in Crescent City, California and is responsible for obtaining permits for the Gasquet Mountain Project.

Role: Mining Industry

Contact Information: California Nickel Corp.
Post Office Box 1170
Crescent City, CA 95531
(707) 464-9441

Danny Oliva is the Superintendent for Brown Sand, Inc., of Manteca, California, in charge of land excavation and reshaping the property on which the Oakwood Lakes Resort recreation project is being developed.

Role: Mining Industry

Contact Information: Brown Sand, Inc.
874 E. Woodward Avenue
Manteca, CA 95336
(209) 239-4837

Elias Ornelas is a Councilman for the City of Irwindale, a city which presently has over 700 acres of active quarrying and 100 to 150 acres to be reclaimed to second uses in the near future.
Role: Local Government
Contact Information: City of Irwindale
Post Office Box 2064
Irwindale, CA 91706
(818) 962-3381

David Otto is the Principal Planner for Sierra County. He and his staff are responsible for site inspection before initial permitting, environmental assessment in accordance with California's Environmental Quality Act, and periodic inspection of mining operations to insure their adherence to State requirements.
Role: Local Government
Contact Information: County of Sierra
Post Office Box 425
Downieville, CA 95936
(916) 289-3251

Thomas A. Parilo, Assistant Planning Director for the Nevada County Planning Department, handles land use applications, including technical review, coordination, and processing of all mining and reclamation plan projects in Nevada County, as well as administering EIR consultant bidding and selection process.
Role: Local Government
Contact Information: Nevada County Planning Department
10433 Willow Valley Road
Nevada City, CA 95959
(916) 265-1440

Tito Patri, a landscape architect and planning consultant, is a partner in The Planning Collaborative of San Francisco, and is the former Chairman of California's State Mining and Geology Board.
Role: Consulting, Planning, State Government
Contact Information: The Planning Collaborative
Pier 33 North, The Embarcadero
San Francisco, CA 94111
(415) 398-8167

Thomas W. Perry is a Construction Engineer for Teichert Construction of Sacramento, California, responsible for the engineering and construction of reclamation projects for one of California's most active mining companies.
Role: Mining Industry, Engineer
Contact Information: Teichert Construction
Post Office Box 15002
Sacramento, CA 95851
(916) 484-3317

Jake Raper is Principal Planner for El Dorado County Community Development Department. He provides the necessary coordination to insure that reclamation plans are developed to satisfy county requirements.
Role: Local Government
Contact Information: El Dorado County Community
Development Department
360 Fair Lane
Placerville, CA 95667
(916) 626-2438

John Rapp is the Senior Geologist for the California Department of Conservation's Division of Mines and Geology, managing the Division's Publications Program.
Role: State Government, Geology
Contact Information: Division of Mines and Geology
Department of Conservation
1416 - 9th Street, Room 1341
Sacramento, CA 95814
(916) 323-8123

Reginald E. Reid is a Geologist with the Bureau of Land Management in Sacramento, providing guidance to the district offices on all aspects of mining under the Mining Law of 1872, including review of mining plans, environmental assessments and reclamation information.
Role: Federal Government, Geology
Contact Information: Bureau of Land Management
2800 Cottage Way
Sacramento, CA 95825
(916) 484-4983

Bland Richardson is a Research Scientist on the Mined Land Rehabilitation Research Work Unit of the U. S. Forest Service in Logan, Utah. He does research on forestry reclamation techniques, watershed management, reclamation of surface mined land, and reclamation of acid- and toxic waste-producing mines for the Intermountain Forest and Range Experiment Station.
Role: Federal Government, Forestry, Revegetation
Contact Information: Intermountain Forest and
Range Experiment Station
Forestry Sciences Laboratory
860 North 12 East
Logan, UT 84321
(801) 752-1311

Albert Ridley, consulting geologist with Johnston-Ridley-McConnell, works with planners on the development of properties, providing geotechnical and geological studies for the planning of mining and second uses.
Role: Consulting, Geology
Contact Information: Johnston-Ridley-McConnell
2717 North Main Street
Suite 7A
Walnut Creek, CA 94596
(415) 947-2900

Dr. James A. Roberts is a consulting geographer and natural resource planner and the former Director of the California Office of Resources, Energy, and Permit Assistance (OREPA).
Role: Consulting, Planning
Contact Information: 540 Morris Way
Sacramento, CA 95825
(916) 484-7124

Marika Rosen is a recent graduate of Brown University and is now on the staff of The Institute for the Human Environment.
Role: Conference Staff
Contact Information: The Institute for the Human Environment
312 Sutter Street, Suite 608
San Francisco, CA 94108
(415) 956-1230

Nancy Salustro is the Public Affairs Director for the J.L. Shiely Company in St. Paul, Minnesota and is responsible for environmental compliance and reclamation.
Role: Mining Industry
Contact Information: J. L. Shiely Company
1101 N. Snelling
St. Paul, MN 55108
(612) 646-8601

Frank Schnitzer works for the Department of Geology and Mineral Industries in the State of Oregon and is the inspector for the northern half of that state. He reviews mining application permits and inspects all mines in his jurisdiction on an annual basis.
Role: State Government
Contact Information: Dept. of Geology & Mineral Industries
1129 SE Santiam Road
Albany, OR 97321
(503) 967-2039

Dr. M. Douglas Scott is the Director of Montana State University's Institute of Natural Resources and has developed a computer program that evaluates the feasability of various second use schemes for mined land.
Role: Education, Computers
Contact Information: Montana State University
Bozeman, MT 59717
(406) 994-2432 or 2891

N. Manfred Shaffer is the Land Manager for Granite Rock Company in California, in charge of reclamation plan preparation for his company's many surface mining operations.
Role: Mining Industry
Contact Information: Granite Rock Company
Post Office Box 151
Watsonville, CA 95077
(408) 724-5611

Bahman Sheik-Ol-Eslami works for Engineering Science, a California consulting firm that prepares environmental studies for mining companies and the government to determine the impact of mining operations on ground and surface water, air quality, and ecology.
Role: Consulting, Environmental Impact
Contact Information: Engineering Science
600 Bancroft
Berkeley, CA 94710
(415) 548-7970

Steve Shower works for Teichert Aggregates, a mining company in Sacramento, California, and is responsible for securing approvals and permits and updating them as needed.
Role: Mining Industry
Contact Information: Teichert Aggregates
Post Office Box 15002
Sacramento, CA 95851
(916) 484-3329

Matt Shumaker is the Area Geologist for the Bureau of Land Management in Riverside, California, and is experienced in reclamation opportunities and restraints on public lands.
Role: Federal Government, Geologist
Contact Information: Bureau of Land Management
1695 Spruce
Riverside, CA 92507
(714) 351-6663

Joseph Siefke is a Mine Geologist for United States Borax in California, in charge of geological mapping and engineering-related concerns for the company.
Role: Mining Industry, Geology, Engineering
Contact Information: United States Borax
Borax Road
Boron, CA 93516
(619) 762-5191

Michael Simmons works for the USDA Soil Conservation Service, a Federal agency that is concerned with long-range land use, which includes both the development and the conservation of natural resources. They are involved in land shaping, providing information on soil, plant science, agronomy, forestry, engineering and drainage.

Role: Federal Government, Engineering, Revegetation

Contact Information: USDA Soil Conservation Service
318 Cayuga Street #206
Salinas, CA 93901
(408) 443-2260

James N. Simpson is a landscape architect for the civil engineering firm of Ruth & Going in San Jose, California. He has worked on the preparation of reclamation plans for gravel quarries in the Santa Clara area, including several phased reclamation schemes and revegetation projects.

Role: Consulting, Planning, Revegetation

Contact Information: Ruth and Going, Inc.
Post Office Box 26430
San Jose, CA 95159
(408) 297-8273

Scott Slotterback is a Project Manager for Norman T. Gilroy and Associates, consultants in mining reclamation planning and second uses.

Role: Consulting, Planning, Conference Staff

Contact Information: Norman T. Gilroy and Associates
312 Sutter Street, Suite 608
San Francisco, CA 94108
(415) 956-1230

John Small is in charge of overseeing the mining operations on land owned by the Crow Tribe in Montana.

Role: Mining Industry

Contact Information: Crow Tribe
Post Office Box 159
Crow Agency, MT 59022
(406) 638-2952

Douglas Sprague is the special Representative to the State Mining and Geology Board within the California Department of Conservation.

Role: State Government

Contact Information: State Mining & Geology Board
1416 - 9th Street, Room 1326-2
Sacramento, CA 95814
(916) 322-1082

John Steere is a landscape architecture and planning student at U.C. Berkeley.

Role: Student, Planning, Conference Staff

Contact Information: 3128 Eton Avenue
Berkeley, CA 94705
(415) 653-8094

Cathy Stein is a Planner for the County of Monterey, California, reviewing permits and reclamation plans.
Role: Local Government
Contact Information: Planning Department
County of Monterey
Post Office Box 1208
Salinas, CA 93902
(408) 422-9018

Rudolph Strand is the Supervising Geologist for California Department of Conservation's Division of Mines and Geology and Supervisor of the Urban and Non-Urban Mineral Land Classification Programs under California's Surface Mining and Reclamation Act.
Role: State Government, Geology
Contact Information: Division of Mines and Geology
Department of Conservation
1416 - 9th Street
Sacramento, CA 95814
(916) 322-3572

Chris Stuart is the General Manager of Oakwood Lake Resort in Manteca, California, a former quarry, now a 300-acre recreation park with cable waterskiing, outdoor amphitheaters, 5-Star R.V. campground, and a variety of water-oriented recreation facilities.
Role: Land Use, Recreation
Contact Information: Oakwood Lakes
874 East Woodward Avenue
Manteca, CA 95336
(209) 239-4929

Leonardo H. Suzio is the Vice-President and Operator of York Hill Trap Rock Quarry in Meridien, Connecticut.
Role: Mining Industry
Contact Information: York Hill Trap Rock Quarry Company
Post Office Box 748
Westfield Road
Meriden, CT 06450
(203) 237-8421

Charles L. Taylor, Vice-President and Principal Geologist for Geomatrix consultants, is an engineering geologist with extensive experience in geologic evaluations for geotechnical, environmental and land use planning projects. He has also served on a number of technical advisory committees for public agencies in Northern California.
Role: Consulting, Geology, Engineering
Contact Information: Geomatrix Consultants
1330 Broadway, Suite 950
Oakland, CA 94612
(415) 839-6102

Lorraine Van Kekerix is an Associate Land and Water Use Analyst specializing in erosion control and revegetation for the California Department of Conservation's Division of Mines and Geology.

Role: State Government

Contact Information: Division of Mines and Geology
Department of Conservation
610 Bercut Avenue
Sacramento, CA 95814
(916) 323-8566

Bob Van Overbeek is the Vice-President and Operator of Seven/Eleven Materials, Inc., a sand and gravel mining operation in the San Joaquin Valley of California.

Role: Mining Industry

Contact Information: Seven/Eleven Materials, Inc.
Post Office Box 4038
Modesto, CA 95352
(209) 529-4050

William B. Williams is the Project Manager of the Big Canyon Project in Shingle Springs, California for the Goldfields Mining Company.

Role: Mining Industry

Contact Information: Gold Fields Mining Corporation
Post Office Box 1310
Shingle Springs, CA 95682
(916) 677-5009

Kenneth Winter is in the Project Planning Division for Orange County, California, and is primarily involved in long-range planning for the County, which includes second uses of mined land.

Role: Local Government

Contact Information: County of Orange
Project Planning Division
Environmental Management Agency
Post Office Box 4048
Santa Ana, CA 92702
(714) 834-5387

Bruce Woolpert is Chairman of the Board for Granite Rock Company, a large mining company in Northern California, and is a long-time Board Member of the National Crushed Stone Association.

Role: Mining Industry

Contact Information: Granite Rock Company
Post Office Box 151
Watsonville, CA 95077
(408) 724-5611

Alex Young is a Landscape Architect for the Bureau of Land Management's California office. He is responsible for the Visual Resources Management Program, establishing policy and guidance, and providing technical assistance for the planning and development of all activities on public lands, including mining, energy development, timber management, and recreational development.

Role: Federal Government

Contact Information: Bureau of Land Management
2800 Cottage Way
Sacramento, CA 95825
(916) 484-4541

APPENDIX

Conference Program and Agenda

The material in this section is included as a reference to the actual event as it unfolded at the Asilomar Conference Center in Pacific Grove, California, from September 18-21, 1984. Some last minute changes occurred in the course of the conference. Sessions originally planned for the Curlew Room were moved to Tritan and a few speakers originally listed in the program were unable to attend.

The first two pages detail the conference agenda, and show the time and location of each workshop. The rest of the program provides backround on the intentions for each workshop, and on the people who were invited to be speakers or panelists.

PRE-CONFERENCE - TUESDAY, SEPTEMBER 18, 1984		**Meeting Room**
3:30	**REGISTRATION** ends at 6:00	Admin. Building
5:00	**RECEPTION**/Informal Gathering	Scripps Patio
6:00	Dinner and **WELCOMING REMARKS**	Private Dining Room

DAY ONE - WEDNESDAY, SEPTEMBER 19, 1984		**Meeting Room**
7:30	Breakfast service begins	Crocker Dining Hall
8:00	**REGISTRATION** - until 10:00 AM	Admin. Building
9:00	**OPENING WELCOME AND BRIEFING**	Chapel
9:30	THEMATIC PRESENTATION	Chapel
10:15	Break	
10:40	**KEYNOTE PANEL** Chapel	
12:00	Lunch	
2:30	**SESSION 1 - WORKSHOPS** (held concurrently)	
	Workshop A - Broadened Horizons - New Approaches for the Mining Industry	Scripps Patio
	Workshop B - Working Together - New Opportunities for Collaboration Between Industry and Government	Marlin
	Workshop C - Working Together - New Opportunities for Collaboration Between Industry and the Developer	Curlew
	Workshop D - Encouraging Second Use Opportunities on Public Lands	Toyon
	Workshop E - Improving Understanding Through Communication and Education	Acacia
4:30	Break	
6:00	Dinner	Crocker Dining Hall

PRODUCTIVE SECOND USES OF MINED LAND

DAY TWO - THURSDAY, SEPTEMBER 20, 1984		**Meeting Room**
7:30	Breakfast service begins	Crocker Dining Hall
9:00	**SESSION 2 - WORKSHOPS** (held concurrently)	
	Workshop A - Development as a Productive Second Use	Marlin
	Workshop B - Agriculture and Forestry As Productive Second Uses	Curlew
	Workshop C - Recreation and Tourism as Productive Second Uses	Acacia
	Workshop D - Reclamation as Art	Toyon
11:00	Break	
12:00	Lunch	
1:30	**SHOWCASE SESSIONS** (held concurrently)	
	Showcase A - Government's Role in the Reclamation Process	Scripps
	Showcase B - Reclamation Abroad	Chapel
3:00	Break	
3:30	**SESSION 3 - WORKSHOPS** (held concurrently)	
	Workshop A - Planning for the Second Use	Marlin
	Workshop B - Second Uses - A Medium for Developing Relationships Between Industry and the Communty	Curlew
	Workshop C - Computers and Models as Planning Tools	Toyon
	Workshop D - The Economics of Implementing and Marketing the Second Use	Acacia
5:30	Break	
6:00	Dinner	Crocker Dining Hall

DAY THREE - FRIDAY, SEPTEMBER 21, 1984		**Meeting Room**
7:30	Breakfast service begins	Crocker Dining Hall
9:00	**WRAP UP SESSION**	Chapel
10:45	**CLOSING REMARKS**	Chapel
11:00	ADJOURN	
12:00	Lunch	Crocker Dining Hall

ACKNOWLEDGEMENTS

This conference owes a debt of gratitude to a number of individuals whose tireless efforts over a period of almost a year have made it a success.

In the California Department of Conservation, our thanks go to Don Blubaugh, Director; James F. Davis, State Geologist; Tom Gay, Deputy State Geologist; and Carol Thomas, Assistant to the Director.

Special thanks go to individuals within the Reclamation Program of the Department of Conservation including: John T. Alfors, Environmental Geology Officer; Zoe Mankoski, Reclamation Program Manager; Ken Cole, Reclamation Specialist/Engineering Geologist; Barbara Evoy, Reclamation Specialist/ Hydrologist; and Lorraine Van Kekerix, Reclamation Specialist/Revegetation.

At The Institute for the Human Environment, our thanks go to Norman Gilroy, President; Scott Slotterback, Project Director; Shelley Arrowsmith, Conference Registrar; and staff members Andy Gustavson, Phyllis LaVoir, Nancy Dakin and Marika Rosen.

Our Steering Committee members gave generously of their time and expertise. They include: Tom Parilo, Assistant Planning Director, Nevada County Planning Department; Gene Andreuccetti, State Conservationist, U.S.D.A. Soil Conservation Service; Jack Heck, Chairman, Reclamation Subcommittee, State Mining and Geology Board; Alcides Freitas, Environmental Coordinator, Sacramento County Planning Department; Jack Streblow, Basalt Rock Company; Raymond E. Krauss, Project Environmental Manager, Homestake Mining Company; Robert Matthews, Lecturer, Department of Geology, U. C. Davis and Member of the State Mining and Geology Board; Zoe Mankoski, Program Manager, State Mined-Land Reclamation Program, California Department of Conservation; Norman T. Gilroy, President, The Institute for the Human Environment; and Tom Gay, Chief Deputy State Geologist, Division of Mines and Geology, Department of Conservation.

Joining them at the Planning Meeting in March 1984 were Denton W. Carlson, Director, Mineral Area Management Staff, U. S. Forest Service; Don Reining, President, Southern California Rock Products Association; Gene Block, Vice-President and Properties Manager of CONROCK; Tito Patri, The Planning Collaborative, Inc. and Member of the State Mining and Geology Board; Pierre Mousset-Jones of Mackay School of Mines, Nevada; Carol Thomas, Assistant to the Director, Department of Conservation; Harold J. Biaggini, California Cattleman's Association; Catherine Munson, President, Lucas Valley Properties Inc.; "Doc" Merrill, attorney with McCutchen, Doyle, Brown, Enersen; Marion Ely, Consultant; Lowell Chamberlain of Johnson, Chamberlain & Co.; Donald R. Ham, DRH Investment Company; Ed Biaggini III, Vice-President, Buena Vista Mines, Inc.; and John T. Alfors, Environmental Geology Officer, Division of Mines and Geology, Department of Conservation.

Our thanks to you, one and all. We couldn't have done it without you!

PRODUCTIVE SECOND USES OF MINED LAND

In the summer of 1983 the California Department of Conservation, through its Division of Mines and Geology, and the Institute for the Human Environment, a San Francisco based public service organization, began discussing the idea of a conference on the topic of mined land reclamation.

It was agreed that the conference would have the purpose of advancing the state-of-the-art of mined land reclamation planning by focusing on opportunities for second uses of mined lands. Experts from the fields of mined land reclamation and land use planning, mining, economics, marketing, government, and conservation would be invited to identify common interests, improve their understanding of each other's roles and perspectives, and exchange information and specific examples of successful mined land reclamation and second use planning. Emphasis was to be on idea-sharing in a workshops setting designed to maximize discussion between participants.

The State of California's interest in the topic of mined land reclamation is based primarily on the Surface Mining and Reclamation Act (SMARA), passed by the Legislature in 1975 and amended in 1980. SMARA provides for a cooperative approach to reclamation planning in California involving cities and counties (SMARA lead agencies that have regulatory responsibility), the mineral industry, and the Department of Conservation. Participation in this conference is a part of the Department's Reclamation Program activity, which includes policy guidance by the State Mining and Geology Board to lead agencies, and technical advice by the Division of Mines and Geology to lead agencies upon their request.

The Institute for the Human Environment focuses its efforts on promoting an exchange of knowledge on emerging issues that affect the quality of life of people in urbanizing communities. Almost every urban or rural area is affected by mining of some kind. The conference was therefore seen by the Institute as a timely activity, capable of advancing the state-of-the-art of an important issue at a time when widespread attention is being given to new legislation, regulation, and research on the topic of mining and reclamation in the United States and abroad.

In February of 1984, a planning meeting was held to provide input in developing the conference program. Selected representatives of the mining industry, lead agencies, Federal and State government, developers, and conservationists met for a day and a half to solidify the conference theme, to identify potential broad topics for conference discussion, and to confirm the general participatory approach of the conference.

As joint sponsors of the conference, both the Department of Conservation and The Institute for the Human Environment thank you for your participation in this event and for your help in making it exciting and productive. We have every hope that your contributions and insights will enhance the state-of-the-art of reclamation planning, and will encourage more widespread consideration of the after-use potential of mining properties.

PRODUCTIVE SECOND USES OF MINED LAND

WELCOMING RECEPTION & DINNER

PRE-CONFERENCE
Tues. 9/18/84
5:30 - 8:30 PM

Conference registration begins at 3:30 PM in the Administration Building.

An informal gathering will take place at about 5:00 PM to enable the conferees to get to know one another, meet and greet old friends, and get a sense of the Asilomar Conference grounds.

Dinner will start at 6:00 PM. Meet in front of the main dining room to receive directions to our private Dining Room for the evening. Toward the end of the meal, there will be welcoming remarks from representatives of the conference's sponsors, co-sponsors, and supporting organizations.

SPEAKERS

Welcoming remarks by:

- **Don Blubaugh**, Director, Department of Conservation, on behalf of the State of California
- **Norman T. Gilroy**, President of The Institute for the Human Environment
- **William Carter**, President of the National Crushed Stone Association

PRODUCTIVE SECOND USES OF MINED LAND

OPENING
WELCOME AND BRIEFING

DAY ONE
Wed. 9/19/84
9:00 to 9:30 AM

Breakfast will be served from 7:30 in the Dining Room.

Registration will be open from 8:00 - 10:00 AM in the Administration Building.

The Conference begins at 9:00 AM in the Chapel Auditorium.

9:00 AM - **Opening Remarks and a Welcome by the Joint Sponsors**

- **Don Blubaugh**, Director of the California Department of Conservation, on behalf of the State of California
- **Norman Gilroy**, President of The Institute for the Human Environment

9:20 to 9:30 AM - **Briefing on the Conference**

Members of the Institute team will discuss how the Conference is organized, and then will review the agenda.

PRODUCTIVE SECOND USES OF MINED LAND

THEMATIC PRESENTATION
PRODUCTIVE SECOND USES OF MINED LAND

DAY ONE
Wed. 9/19/84
9:30 to 10:15 AM

THEME

To many people "reclamation" is synonomous with "revegetation". Reclamation is also frequently seen as a "cost" to be borne by the operation.

Yet many modern mining companies are finding that reclamation can be the path to productive after-use of the property once mining is complete -- a source of untapped second profits and a way to develop more harmonious relationships with the local community and its governmental agencies.

A presentation and slide show will illustrate a wide variety of projects from all over the world where mining sites have been converted to "productive second uses" -- commercial, industrial, or residential development; sports and recreation; tourism; and agriculture or forestry; etc. Each contains ideas that could be adapted to another place. Most will be covered in more depth by a variety of panelists during the conference.

PRESENTER

- **Norman Gilroy** is an architect and environmental planner. He has been the principal of Norman T. Gilroy & Associates of San Francisco, and since 1972, has served as the President of The Institute for the Human Environment, a public service organization.

PRODUCTIVE SECOND USES OF MINED LAND

KEYNOTE PANEL
OUR ROLES AND PERSPECTIVES -
PRODUCTIVE SECOND USES OF MINED LAND

DAY ONE
Wed. 9/19/84
10:40 to 12 NOON

THEME

The conference will be a meeting ground for people from a wide variety of disciplines associated with mining, reclamation and land use, each with its own concerns, priorities, and expectations of the reclamation planning process.

In this keynote panel, representatives of industry, government, development, and conservation interests will discuss the roles of each sector in the mining, reclamation and land use process.

PANELISTS

- **A. Allan Hill**, Chairman of the President's Council on Environmental Quality in Washington, D.C., will represent government.
- **Bruce Wolpert**, long time member of the Board of the National Crushed Stone Association, and President of Granite Rock of Watsonville, California, will represent the mining industry.
- **Leo Molinaro**, President, American City Corporation (a Rouse Company), will represent the development and land use sector.
- **Harriet Burgess**, Vice-President and Washington Government Liaison for Trust for Public Land, will speak about the concerns of conservation interests.

PRODUCTIVE SECOND USES OF MINED LAND

SESSION 1 - WORKSHOP A
BROADENED HORIZONS -
NEW APPROACHES FOR THE MINING INDUSTRY

DAY ONE
Wed. 9/19/84
2:30 - 4:30 PM

THEME

The business world is changing. Mining companies are increasingly being required to consider environmental issues, to work closely with their neighbors and neighboring communities throughout the mining operation, and to leave their properties in usable condition once mining is complete.

Many American States, and many other countries, have legislation which requires reclamation of mined lands. Reclamation - and the cost associated with it - is a part of many budgets for mining operations today.

Are there ways that the "cost" of reclamation can be seen as an investment for the future that can be turned into "second profits"? Is it possible that the mining company might enjoy better working relationships with the community in which it works if it defines the intended use of the property once the mining period is over? Can mining companies, large and small, handle not only sales and extraction, but also the process of converting the mining site to second uses?

These questions will be discussed by a group of representatives from the mining industry and its Associations.

PANELISTS

- **William Carter**, President of the National Crushed Stone Association in Washington, D.C.
- **Robert A. Good**, President of Kaiser Sand and Gravel (a subsidiary of Koppers Company), and President of the Northern California Aggregate Producers Association.
- **Jack Streblow** of Basalt Rock Company (a Dillingham Company), and member of the Board of the National Crushed Stone Association.

PRODUCTIVE SECOND USES OF MINED LAND

SESSION 1 - WORKSHOP B
WORKING TOGETHER - NEW OPPORTUNITIES FOR COLLABORATION BETWEEN INDUSTRY AND GOVERNMENT

DAY ONE
Wed. 9/19/84
2:30 - 4:30 PM

THEME

Both industry and government play major roles in the process through which the reclamation and second use of mined land comes about.

The mining company understands the mineral resource that lies under the land, and is responsible for mining it, often over decades of time. As it does so, it must work closely with the community it serves, both during the mining period and as the property is converted to its second uses. Materials produced by the mining operation are often of vital importance to the local community.

The local community, and its governmental agencies, is responsible for reviewing and ruling upon the mining and reclamation plans proposed by the mining company, and for making sure that they fit into the long-term objectives of their community.

Often, the relationship between the mining company and the local community is an uneasy one - yet, there is much to be gained if a cooperative working relationship can be created and sustained. Planning for long-term uses of the mining site can often be the focus around which a working relationship can be established - but, for that to happen, both must approach the relationship in a spirit of trust and cooperation.

This workshop will examine what new opportunities are available to the mining industry and government through working together. Is cooperation possible without compromising the values and standards important to each? How have others arrived at cooperative relationships that might be models for communities and mining companies elsewhere?

PANELISTS

- **Ray Krauss**, Project Environmental Manager for the McLaughlin project of Homestake Mining Company.
- **Thomas Parilo**, Assistant Planning Director, Nevada County, California.
- **John J. Heck**, Member of the California State Mining and Geology Board, and former Manager of Engineering and Maintenance for Kaiser Sand and Gravel.
- **Matt Schumaker**, Area Geologist, Bureau of Land Management, California Desert District.

PRODUCTIVE SECOND USES OF MINED LAND

SESSION 1 - WORKSHOP C
WORKING TOGETHER - NEW OPPORTUNITIES FOR COLLABORATION BETWEEN INDUSTRY AND THE DEVELOPER

DAY ONE
Wed. 9/19/84
2:30 - 4:30 PM

THEME

This workshop will compare the objectives of the mining operator and the land use developer, looking for areas of common interest and points of difference in the needs and expectations of each.

Is the average mining company capable of acting as both mineral extractor and developer of the land after mining is complete? What is the range of investment and development opportunities available to both mining companies and land use developers through the implementation of second uses on the mining site?

What are the primary goals of each? How does each approach its investments and the return expected from their land? At what point might alliances occur that could be productive to both? What form might those alliances take?

Can developers and the mining industry be served by establishing a cooperative relationship early in the mining process - or is that relationship only workable toward the end of the mining process, or after mining is complete?

Panelists will approach these questions from a variety of standpoints, outlining the points of common interest, and identifying the major areas of difference which need to be resolved in a cooperative relationship, or which might prevent a cooperative relationship from maturing.

PANELISTS

- **Catherine Munson**, President, Lucas Valley Properties, a broker, investor and developer with property interests in the San Francisco and Palm Springs areas.
- **Gene Block**, Vice-President and Properties Manager for CONROCK, in Los Angeles, a mining company with in-house capabilities in both mining and land use development.
- **Edward 'Doc' Merrill**, lecturer with the Bar Association and real estate attorney and lecturer with McCutcheon, Doyle, Brown & Enersen of San Francisco.

PRODUCTIVE SECOND USES OF MINED LAND

SESSION 1 - WORKSHOP D
ENCOURAGING SECOND USE OPPORTUNITIES ON PUBLIC LANDS

DAY ONE
Wed. 9/19/84
2:30 - 4:30 PM

THEME

The Federal Government is the largest owner of land used for mining in the United States. Yet, it seems, the permitting process for mining on public lands is not now oriented to early consideration of second use opportunities. Mining projects and developmental projects on public lands are usually reviewed under quite separate and different approvals and leasing processes.

Can the land shaping process and other reclamation treatments associated with a mining project on public lands be the ideal preparation for a second use? Would there be benefits to the surrounding community and the public land manager if planning began early to identify the likely use of the land after the mineral extraction process is over?

What are the barriers to second use planning in the federal permitting process for mining operations, and what laws are they based upon? Where are the opportunities for flexibility and new ideas? What changes are needed in the law to allow for, and even encourage, long-range planning of second uses of mining projects on public land? How could they be brought about?

PANELISTS AND TOPICS

- **Denton W. Carlson**, Director, Minerals Area Management Staff, the U.S. Forest Service in California, representing one of the largest federal land owners.
- **Reginald Reid**, Geologist with the Bureau of Land Management in California, another of the largest federal land owners involved with mining projects.
- **Richard Deery**, Geologist with the Washington office of the Bureau of Land Management.
- **Bland Richardson**, Research Scientist, Surface Mining and Reclamation Project U.S.D.A. Forest Service, Intermountain Forest and Range Experiment Station, Logan, Utah.

PRODUCTIVE SECOND USES OF MINED LAND

SESSION 1 - WORKSHOP E
IMPROVING UNDERSTANDING THROUGH COMMUNICATION AND EDUCATION

DAY ONE
Wed. 9/19/84
2:30 - 4:30 PM

THEME

In almost every conference which deals with reclamation and the mining industry, there is a call for "better understanding", both from the mining industry and the public. Yet, frequently, attempts at education take place in the middle of a conflict over a project when it is very difficult to sucessfully develop understanding.

How well does the public understand the mining industry and the importance of its products to our society? What is the image of the mining industry in the public eye? Is that image deserved? Is the second use potential of mined land understood? Could better planning for after-use of mining sites improve the industry's image?

What are the prospects for an improved understanding between the mining industry and the local community? What opportunities does the second use planning process offer to improve understanding? What attempts have been made, and how successful have they been? What can we learn from each other? What can mining companies, mineral industry associations, government, and the universities do that would be useful to improving understanding at the local level where decisions are made?

PANELISTS

- **Paula Fink**, Director of Public Affairs for the National Crushed Stone Association in Washington, D.C., a national association of mining organizations in the United States.
- **Robert Matthews**, Senior Lecturer with the Department of Geology at the University of California at Davis, and member of the California Mining and Geology Board.
- **Jake Raper**, Principle Planner for El Dorado County, California.
- **William Williams**, Project Manager of the Shingle Springs Project for the Gold Fields Mining Corporation in El Dorado County, California.

PRODUCTIVE SECOND USES OF MINED LAND

SESSION 2 - WORKSHOP A
DEVELOPMENT AS A PRODUCTIVE SECOND USE

DAY TWO
Thur. 9/20/84
9:00 - 11:00 AM

THEME

By the time mining is complete, many mining properties are ideally located for residential, commercial or industrial development. Often mines are encircled by the very communities which their products have helped to build.

The highways, waterways, services, water supplies, drainage ponds and plantings built and paid for by the mining operation can be of significant value in the later development of the site. With proper planning, the mining site can be superior to all other similar properties in the area. The site can be prepared for a second use which makes it into a mature development site when mining is over, and maximizes its value to the mining company and the community, of which it is a part.

If the mining process has shaped the land in a way that makes conversion to developmental use simple, then second values may be available to the operator and developer that are worth many times the profits made from selling the material removed from the mine. A mining site may not, however realize the potential for development if the mining operation is not sensitive to potential second uses, which can result in social and economic gains to the mine operator and community.

Preparation for developmental second uses requires a kind of long term creative thinking. Much can be learned from the successes and failures of others who have gone before.

This workshop will focus, through slides and Case Study presentations, on a number of types of land use development that are appropriate to the second use of mined land in both urban and urbanizing areas. It will also examine how those uses can be structured to enable them to fit the needs of the marketplace once mining is complete.

PANELISTS AND TOPICS

- **Leo Molinaro**, President, American City Corporation (a Rouse Company).
- **Norman Gilroy**, President of Norman T. Gilroy and Associates, consultants to industry and government in environmental management and reclamation.
- **Gene Block**, Vice President and Properties Manager, CONROCK, in Los Angeles.
- **Catherine Munson**, President of Lucas Valley Properties in Marin County, a broker, investor and developer with interests in the San Francisco region and Palm Springs area.

PRODUCTIVE SECOND USES OF MINED LAND

SESSION 2 - WORKSHOP B
AGRICULTURE AND FORESTRY AS PRODUCTIVE SECOND USES

DAY TWO
Thur. 9/20/84
9:00 - 11:00 AM

THEME

Agriculture and forestry are often the most appropriate second uses for land in rural areas that has been subjected to mining. Often, however, reclamation is viewed as more of a cost to the mining operation than a source of additional revenue, and 'revegetation' or cosmetic landscaping is the limit of what is proposed.

Many places throughout the United States, Canada, and Europe, have seen the successful re-establishment of high quality land capable of supporting high yield crops (grapes, orchards, kiwi fruit, feed crops, etc.). In Scandinavia and parts of the U.S., successful experiments are underway with fuel-wood forests capable of making a considerable contribution to the world's growing energy supply problem.

Yet, most mining operators do not see themselves as farmers or foresters. Some of those who have combined the roles have found the experiment to be both rewarding and good business.

Panelists with on-the-ground experience in the United States, Canada and the United Kingdom will discuss the problems and rewards associated with converting mining sites to agricultural and forestry uses.

PANELISTS AND TOPICS

- **Sarah B. Lowe**, Supervisor of Rehabilitation and Property Improvement for TCG Materials, Ltd., a mining company with many years of experience in agricultural reclamation in Brantford, Ontario, Canada.
- **Thor Bailey**, of Energy Production in Chico, California, a company with a great deal of experience in the establishment of fuel-wood plantations.
- **Dr. Stuart McRae**, Professor at Wye College (University of London), in England, a consultant to industry in agricultural reclamation in the United Kingdom, with particular experience in agricultural reclamation on methane producing landfill sites.
- **Walter Davidson**, Research Forester with the Northeastern Forest Experiment Station of the U. S. Department of Agriculture Forest Service in Princeton, West Virginia.

PRODUCTIVE SECOND USES OF MINED LAND

SESSION 2 - WORKSHOP C
RECREATION AND TOURISM AS PRODUCTIVE SECOND USES

DAY TWO
Thur. 9/20/84
9:00 - 11:00 AM

THEME

Frequently the mining site has unique qualities of location or terrain which make it most appropriate for recreation or tourist activities after extraction is complete. Lakes and inlets created by sand and gravel operations have been adapted to yacht harbors, beach parks, fishing ponds, sailing ponds, water sport centers, or wildlife habitat. Spoil piles have been re-shaped for sports areas, year-round ski runs, skating rinks, playgrounds, ballparks, concert sites, camp grounds and water slides that attract people from many areas.

Once in a while, a quarry owner creates a garden in a quarry that attracts visitors from far and wide. Elsewhere, the mining history of the area attracts people to visit the mine to see its buildings, and to learn from its historic museum how people worked in a bygone age.

In this workshop, panelists will discuss a variety of Case Studies in the United States and abroad which illustrate recreational and tourism uses of mined land. Ways in which a mining operator might structure his operation to optimize the potential for conversion to this interesting and valuable type of second use will be discussed.

PANELISTS AND TOPICS

- **Chris Stewart**, General Manager of Oakwood Lake Resort in Manteca, California. A water-oriented recreation development in conjunction with an active sand mining operation attracts people from a large area of northern California.

- **Thomas Ford**, Environmental Specialist, Death Valley National Monument. The challenge of reclaiming mined land to a productive second use in one of California's most popular recreation and tourism areas, and one with an extremely harsh desert environment, will be discussed.

- The Holme Pierrepont National Water Sports Center (a multi-purpose tourism and recreation center in Nottingham, England), Big Pit, a deep shaft coal mine in Wales that is now a tourist and historic center, and Butchart Gardens, a horticultural attraction in a quarry in British Columbia, Canada, will be discussed by participants in the Institute's European Study Tour on mining reclamation.

PRODUCTIVE SECOND USES OF MINED LAND

SESSION 2 - WORKSHOP D
RECLAMATION AS ART

DAY TWO
Thur. 9/20/84
9:00 - 11:00 AM

THEME

This workshop will focus on very creative and experimental approaches to second uses of mining sites.

For centuries, the dramatic land forms and lakes of worked out quarries have been a challenge to sculptors, gardeners and artists. With creative ideas, mining sites can become sculptural landscapes that are valuable cultural amenities and open space for the future. Reclaiming mine sites as art provides opportunities for developing new, wholly-imagined environments built upon the features of the mined land. The landscapes that result can be temporary or permanent.

What has been done to reclaim mining sites as art? How can working relationships be developed between miners and artists? What roles can art councils play in reclaiming mine sites as art? What types of funding are available at present, and what are future possibilities? What types of long-term maintenance of art landscapes are necessary, and how can maintenance be funded?

These topics will be discussed and illustrated, using several examples of art landscapes on mining properties in the United States and Europe as case studies.

PANELISTS AND TOPICS

- **Cherie Kluesing**, of the Department of Landscape Architecture at Harvard University, will present her research on "An Aesthetic Approach to Land Reclamation".
- **Timothy Collins**, a mining executive from Virginia City, Nevada, is President of the Board of Trustees of the Sierra Nevada Museum of Art, an active member of the Whitney Museum, a patron of sculptor Robert Smithson, and has plans to engage artists to reclaim a mine site.
- **Steve Costa**, of the Bay Area Partnership, an organization which specializes in assisting local agencies with funding for arts and amenity projects producing high social and aesthetic benefits.
- **Paul Klite**, sculptor and consultant to the State of Colorado, initiated a State mechanism for funding aesthetic solutions to mining reclamation.

PRODUCTIVE SECOND USES OF MINED LAND

SHOWCASE A
GOVERNMENT'S ROLE IN THE RECLAMATION PROCESS

DAY TWO
Thur. 9/20/84
1:30 - 3:00 PM

THEME

Over forty of the States in the United States have passed legislation regarding surface mining and the reclamation of mined lands. Most of the Provinces of Canada and the countries of northern Europe have similar legislation.

Most U.S. States (excluding California), Canadian Provinces, and European countries regulate the reclamation of mined lands at the State level. Many governments are also integrally involved in the reclamation planning process as a stimulator of new ideas and research. Some governments have become major sources of information on new and innovative approaches to reclamation planning, or have instituted and funded programs to reclaim abandoned mining sites.

This Showcase Session will focus on some of the governmental programs in the northern hemisphere. Representatives from the U.S. Bureau of Land Management, the States of California and Oregon, and from the government of Ontario, Canada, will present a synopsis of their roles and responsibilities. They will then respond to questions posed by other panel members and the audience.

PANELISTS

- **Zoe Mankoski**, Manager of California's Mined-Land Reclamation Program, will describe the program administered under the California Surface mining and Reclamation Act of 1976.
- **John Masham**, of the Department of Resources of the Province of Ontario in Canada, will describe Ontario's innovative program.
- **Robert Anderson**, Deputy State Director - Minerals, California Office of the U. S. Bureau of Land Management, will describe BLM's policies for reclamation and second uses.
- **Paul Lawson**, of Oregon's Mined Land and Mineral Industries Program, will discuss that State's program which is tailored to the special conditions of the many small operations found there.

PRODUCTIVE SECOND USES OF MINED LAND

SHOWCASE B
RECLAMATION ABROAD

DAY TWO
Thur. 9/20/84
1:30 - 3:00 PM

THEME

Since the beginning of the Industrial Revolution, large parts of England, Wales and northern Europe have been the sites of both underground and surface mining for coal, iron, slate and limestone, precious metals, and a wide variety of rock products for the construction industry. In these societies a great many people are clustered in a relatively small area. Over the past two hundred years mining companies, government and the communities have developed sophisticated approaches to make their co-existence possible, while allowing the vital underground resources to be recovered and used for the benefit of the growing urban society.

The United Kingdom and Europe are, therefore, sources of information and practical experience on the subject of reclamation and after-use of mined lands. There are examples of revegetation, conversion to agriculture and forestry, and development to industrial, commercial, residential and recreational uses.

In mineral-rich Australia, reclamation is a growing interest of many mining companies and local governments. As its communities and exports grow, Australia is increasing its research in the area of mined-land reclamation. Applications of this information can be of value in other parts of the world.

In this Showcase Session, a wide variety of Case Studies will be presented - some by visitors attending the conference, and by members of an Institute-sponsored delegation which visited England, Wales, Holland and Germany in June 1984.

PANELISTS

- **Professor Stuart McRae**, of Wye College (University of London), will describe agricultural and open space after-use in the United Kingdom.
- **Norman T. Gilroy**, President of The Institute for the Human Environment, and leader of the Institute's recent European Study Tour, will discuss developmental after-use of mining sites in the United Kingdom.
- **Dr. James A. Roberts**, Geographer and Environmental Consultant from Sacramento, California, a delegate on the Institute's recent tour (and co-author of the study report "Productive After-Use in Europe", now being edited for publication), will discuss reclamation and after-use in Holland and West Germany.
- **Dr. Peter Langkamp**, Shell Co. Melbourne, Australia, will discuss second uses and reclamation methods in Australia.

PRODUCTIVE SECOND USES OF MINED LAND

SESSION 3 - WORKSHOP A
PLANNING FOR THE SECOND USE

DAY TWO
Thur. 9/20/84
3:30 - 5:30 PM

THEME

Maximizing the second use values of mined lands is a process which requires thoughtful planning, starting at the beginning of the project and continuing through each of the phases that lead to conversion to the second use. Careful planning can result in increased economic returns to the mining company and in short and long-term benefits to the local community.

Many opportunities occur during the mining process to enhance the long-range productivity of the land without compromising the mining operation or its short-term economic expectations. The permitting process, as part of the reclamation planning process, is an opportunity to define proposed subsequent uses of the land. By using the process in this way, oftentimes community concerns can be addressed through focusing on the second use. The reclamation planning process can establish a framework for a range of planned second uses that can be built into zoning and General Plan objectives of the area.

Reclamation planning requires a sound data base that defines the location of the resources, the environmental sensitivity of the land, surrounding land uses, and the likely long-term growth trends of the area. Early geologic studies are vital to defining the shape of the land once mining is complete. The environmental review process can be turned to advantage in obtaining permits quickly by meshing the goals of the mining company, community desires, and environmental document requirements.

Four panelists, each with a different role in the planning process, will discuss how their specialized knowledge can be used to maximize the productivity of both the mining operation and the second uses which follow it.

PANELISTS AND TOPICS

- **Scott Slotterback**, of Norman T. Gilroy and Associates, environmental planners and specialists in reclamation planning, will discuss "Shaping the Face of the Land".

- **Charles Taylor**, Senior Geologist with Geo Matrix of Oakland and San Francisco, will discuss the case for "Knowing What's Under the Ground".

- **Steve McCutcheon**, President of St. Clair Research Systems, mining consultants, will discuss "Understanding the Property and its Setting".

- **Dr. James A. Roberts**, Geographer and Environmental Consultant, will discuss "Turning the Environmental Review Process to Advantage".

PRODUCTIVE SECOND USES OF MINED LAND

SESSION 3 - WORKSHOP B
SECOND USES - A MEDIUM FOR DEVELOPING RELATIONSHIPS BETWEEN INDUSTRY AND THE COMMUNITY

DAY TWO
Thur. 9/20/84
3:30 - 5:30 PM

THEME

Mining operations benefit by developing good working relationships with the local community and with the governmental officials who are responsible for reviewing the mining operation on behalf of the community. Frequently, a proposal to begin a mine or expand an existing mine generates questions and controversy by the community. Common reactions are: "Do it somewhere, but not near my property"; "the agricultural uses on the surface are much too valuable to lose"; "how will we ever replace the environmental quality of today if we allow mining to start here"; "how do we know what this land will look like in the future"; and "are we opening a Pandora's box for the community in the future if we approve the project?"

A thorough reclamation planning process, one which recognizes both the mining process and potential second uses of the land and includes open discussion with representatives of the communities affected, can result in mining and reclamation that are not only successful for the operator, but also produce assets of great value to the local community.

Both the mining company and the community can benefit from replacing confrontation with a process of negotiation and mutual understanding. The members of this panel will discuss a variety of ways in which both can participate effectively in the reclamation planning process, and will look at alternatives to the process of confrontation that characterizes so many permit and environmental review processes today.

PANELISTS AND TOPICS

- **Jim West**, of Jim West Associates in Washington, D.C., will discuss "Community Relations Approaches for Mining Companies".
- **Alcides Freitas**, Environmental Coordinator with Sacramento County, California, and a member of the California Mining and Geology Board, will discuss "Productive Relationships with the Local Community".
- **Michael Gersick**, of Grattan, Gersick, Karp, Administrative Advocates in Energy and Resources, of Sacramento, California, and former Deputy Director of California's Department of Conservation will discuss "Replacing Confrontation with Negotiation".
- **John Busterud**, environmental consultant and senior counselor for Ecology and Environment, Inc., former Chairman of the President's Council on Environmental Quality, and former President of RESOLVE, will discuss "Environmental Conflict Resolution".

PRODUCTIVE SECOND USES OF MINED LAND

SESSION 3 - WORKSHOP C
COMPUTERS AND MODELS AS PLANNING TOOLS

DAY TWO
Thur. 9/20/84
3:30 - 5:30 PM

THEME

Technological advances have changed the way long-range planning is carried out for mining properties. Computers can now store enormous amounts of usable baseline information and make programmed value judgments. They can graphically model land forms at various phases of the mining operation, allowing neighbors to view each phase of mine operation proposed. Three-dimensional models can enable planners to examine a wide variety of land configurations before finalizing the Mining and Reclamation Plans. Land shaping and second use strategies can be evaluated to provide a guide for the mining activity.

New hardware, software, and techniques are becoming available every year. In this workshop, a group of experts in the use of computers and modeling techniques for planning will discuss their work and look at opportunities for the future.

PANELISTS

- **Fred Matter**, of the University of Arizona in Tucson, has a long experience in the use of physical models in studying alternative solutions to mining projects and in making effective presentations to local communities.
- **M. Douglas Scott**, of The Institute of Natural Resources at Montana State University, will discuss a computer program designed to analyze and compare a variety of second use concepts for a mining project.
- **Gil Castle**, Vice-President of Comarc Systems of San Francisco, will discuss the use of graphic computers for contour modeling, view analysis, and environmental evaluation in the reclamation planning process.

PRODUCTIVE SECOND USES OF MINED LAND

SESSION 3 - WORKSHOP D
THE ECONOMICS OF IMPLEMENTING AND MARKETING THE SECOND USE

DAY TWO
Thur. 9/20/84
3:30 - 5:30 PM

THEME

Most mining operations are designed to respond to the need for rapid short-term quarterly or annual profits. In many cases, however, decades pass before the second uses planned for the site produce additional income.

Developers and investors involved in developing the second use are also interested in a quick turn-around for their money, and worry about waiting the long periods of time that are often involved in a mining operation. Markets and political moods change, and, to work with a mining site, the long-term investor in land must be flexible and capable of planning his return over the life of the operation.

Can the expectations of the mining company and the developer be accommodated within a single mining project? Can the mining company's profit and loss system be structured to recognize the company's land holdings as growing value, rather than as fixed assets which are a financial burden? Can reclamation costs be treated and planned as investments in the future? Can second use values have a positive effect upon the market value for a mining company? How can the mining property be best positioned within the market as it approaches its second use, with access roads and services easily converted to the second uses, and the property graded and ready to fit the needs of the builders, buyers and developers in the local marketplace?

These are the kinds of questions that will be addressed from an economic point of view in this workshop.

PANELISTS AND TOPICS

- **John Igoe**, of Lincoln Properties, will discuss "The Economic Needs of the Developer".
- **David McGee**, of Basalt Rock (a Dillingham Company), will discuss "The Economic Needs of the Mining Company".
- **Edward 'Doc' Merrill**, real estate attorney with McCutcheon, Doyle, Brown & Enersen, will discuss "Obtaining Assurances While Maintaining Flexibility", a common problem for both the mining company and local government.

PRODUCTIVE SECOND USES OF MINED LAND

WRAP-UP SESSION
THE POTENTIAL FOR PRODUCTIVE SECOND USES OF MINED LAND - A LOOK AT THE FUTURE

DAY THREE
Fri. 9/21/84
9:00 - 11:00 AM

9:00 to 10:45 AM WRAP-UP SESSION

Implementing productive second uses on mined lands is a complex process. It requires an understanding of a variety of economic, social and environmental considerations, as well as an understanding of the perspectives of the various participants in the reclamation planning process. Most of all it requires creativity on the part of all involved. Past successes and experiences can be the key to successful projects in the future.

Over the two days of the conference, participants will have only had the opportunity to participate in a few of the workshops and presentation sessions that have been offered. This session will give conference participants an opportunity to hear the impressions of individuals who have attended other workshop sessions; thereby, providing an overview of the information presented, and a discussion of potential actions and approaches that might encourage productive second uses on mined land.

A question and answer session will allow conferees to add additional viewpoints, to question premises raised in the workshops, and to round out the ideas that have come into focus during the conference program.

10:45 to 11:00 AM CLOSING REMARKS

- **James F. Davis**, State Geologist for the State of California, Division of Mines and Geology, will speak to the theme of "building bridges for better working relationships between the mineral industry, developers, government and the environmental community".

11:00 to 12:00 TIME TO CHECK OUT OF YOUR ROOMS

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